Army Programmatic Environmental Assessment

of the

Mine Resistant Ambush Protected (MRAP) Vehicle Program

December 2010

UNCLASSIFIED: Dist A. Approved for Public Release

Prepared for:

U.S. Army TACOM Life-Cycle Management Command
Warren, Michigan

Prepared by:

Prospective Technology Incorporated
10015 Old Columbia Road, Suite B-215
Columbia, MD 21046

Report Documentation Page

Form Approved
OMB No. 0704-0188

1. REPORT DATE **28 DEC 2010**	2. REPORT TYPE **Technical Report**	3. DATES COVERED **06-07-2010 to 20-11-2010**

4. TITLE AND SUBTITLE **Army Programmatic Environmental Assessment of the Mine Resistant Ambush Protected (MRAP) Vehicle Program**	5a. CONTRACT NUMBER 5b. GRANT NUMBER 5c. PROGRAM ELEMENT NUMBER
6. AUTHOR(S)	5d. PROJECT NUMBER 5e. TASK NUMBER 5f. WORK UNIT NUMBER
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) **Prospective Technology Incorporated,10015 Old Columbia Road,Suite B‐215,Columbia,MD,21046**	8. PERFORMING ORGANIZATION REPORT NUMBER **; #21437**
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES) **U.S. Army TARDEC, 6501 East Eleven Mile Rd, Warren, Mi, 48397-5000**	10. SPONSOR/MONITOR’S ACRONYM(S) **TARDEC** 11. SPONSOR/MONITOR’S REPORT NUMBER(S) **#21437**

12. DISTRIBUTION/AVAILABILITY STATEMENT

Approved for public release; distribution unlimited

13. SUPPLEMENTARY NOTES

14. ABSTRACT

This Programmatic Environmental Assessment (PEA) has been developed by the Army Tank‐Automotive Armaments Command (TACOM) LCMC for the Mine Resistant Ambush Protected (MRAP) Joint Program Office (JPO) to meet the Army requirements of the National Environmental Policy Act (NEPA) of 1969 as amended; the President?s Council on Environmental Quality (CEQ) Regulations for Implementing NEPA (40 CFR 1500&#8208 1508); and Department of the Army (DA) 32 CFR 651 Environmental Analysis of Army Actions; Final Rule March 29, 2002, which implements NEPA and CEQ regulations. Though overdue, its purpose is to inform decision‐makers during future lifecycle phases fielding facilities and the public of the expected and any observed environmental consequences of the proposed action and alternatives. TACOM LCMC has conducted NEPA analyses for the Army family of MRAP vehicles being procured and fielded under the direction of the MRAP Joint Program Office (JPO). The MRAP vehicle program is a joint Service program among the United States (US) Army (USA), US Air Force (USAF), US Navy (USN), US Special Operations Command (USSOCOM) and US Marine Corps (USMC). The USMC has been designated as the lead agency and thus heads the MRAP JPO responsible for all MRAP program activities. The Department of the Navy (DoN) is the MRAP Vehicle Program Executive Agent, and the Commander, Marine Corps Systems Command (COMMARCORSYSCOM) functions as the MRAP Vehicle Program Executive Officer (PEO). The Undersecretary of Defense (USD), Acquisition, Technology and Logistics (AT&L) is the Milestone Decision Authority (MDA).

15. SUBJECT TERMS

<table>
<tr><td colspan="3">16. SECURITY CLASSIFICATION OF:</td><td rowspan="2">17. LIMITATION OF ABSTRACT
Public Release</td><td rowspan="2">18. NUMBER OF PAGES
111</td><td rowspan="2">19a. NAME OF RESPONSIBLE PERSON</td></tr>
<tr><td>a. REPORT
unclassified</td><td>b. ABSTRACT
unclassified</td><td>c. THIS PAGE
unclassified</td></tr>
</table>

Approval:

{signature4}	{date4}

Carl Owens
JPO Deputy Program Manager & Army Project Manager,
TACOM
US Army

Concurrence:

{signature3}	{date3}

Robert L. Adkins
Joint Program Principal for Safety
JPO
USMC

Legal Review:

{signature2}	{date2}

Steve Whittington
Attorney/Advisor
US Army

Preparing Office:

{signature1}	{date1}

Parminder Khabra
Acting Team Leader
TARDEC Materials/Environmental Team
US Army

Executive Summary

This Programmatic Environmental Assessment (PEA) has been developed by the Army Tank-Automotive Armaments Command (TACOM) LCMC for the Mine Resistant Ambush Protected (MRAP) Joint Program Office (JPO) to meet the Army requirements of the National Environmental Policy Act (NEPA) of 1969 as amended; the President's Council on Environmental Quality (CEQ) Regulations for Implementing NEPA (40 CFR 1500-1508); and Department of the Army (DA) 32 CFR 651 *Environmental Analysis of Army Actions*; Final Rule March 29, 2002, which implements NEPA and CEQ regulations. Though overdue, its purpose is to inform decision-makers during future lifecycle phases, fielding facilities and the public of the expected and any observed environmental consequences of the proposed action and alternatives. TACOM LCMC has conducted NEPA analyses for the Army family of MRAP vehicles being procured and fielded under the direction of the MRAP Joint Program Office (JPO). The MRAP vehicle program is a joint Service program among the United States (US) Army (USA), US Air Force (USAF), US Navy (USN), US Special Operations Command (USSOCOM) and US Marine Corps (USMC). The USMC has been designated as the lead agency and thus heads the MRAP JPO responsible for all MRAP program activities. The Department of the Navy (DoN) is the MRAP Vehicle Program Executive Agent, and the Commander, Marine Corps Systems Command (COMMARCORSYSCOM) functions as the MRAP Vehicle Program Executive Officer (PEO). The Undersecretary of Defense (USD), Acquisition, Technology and Logistics (AT&L) is the Milestone Decision Authority (MDA).

This PEA analyzes the expected and any observed environmental consequences of the proposed action and alternatives to the proposed action, including the no-action alternative. The proposed action is the production, testing, training, deployment/fielding, and demilitarization/ disposal of Army MRAP vehicles in the Joint MRAP Vehicle Program (JMVP). Environmental Resource Areas (ERAs) that were analyzed include soils, land use, cultural resources, air quality, water quality, noise, solid waste, hazardous materials and hazardous waste management, biological resources, aesthetic and visual resources, socioeconomics, and health and safety.

The JMVP was based on an urgent need from the field and developed unique development, fielding, and documentation challenges accordingly. This PEA, currently past the completion schedule normally required for traditional acquisition programs, is no exception. In addition to the document delay associated with urgent fielding needs, completion of the PEA was further complicated by frequent program changes, numerous system upgrades, and data gathering from a multitude of contractors. The largest of which was the recent program change to field the MRAP in the Continental United States (CONUS) rather than the initial plan to field only outside of the Continental United States (OCONUS) for wartime operations, where NEPA requirements are not applicable. Thus, while attempting to capture and present the most current information, most, if not all, program activities have occurred prior to the preparation of

this PEA. Additional NEPA analysis and corresponding documentation were or will be prepared for these specific activities. This PEA references the previous NEPA documents and provides an evaluation of impacts at a programmatic level.

This PEA evaluates general use of the Army MRAP vehicles to include test activities at existing areas, training activities on existing ranges, and vehicle maintenance in work areas following written instructions. Army testing, training and fielding installations are responsible for determining whether additional NEPA documentation is required for specific activities that occur at that installation. Each of the Services (USA, USAF, USN, and USMC) will follow their own implementing regulations for NEPA and installation personnel will comply with their Service specific requirements when completing site-specific NEPA documentation. JPO MRAP will provide installation personnel with any required or requested system information in support of their service or facility specific NEPA analysis and documentation preparation.

Environmental Consequences

Suppliers of MRAP vehicles utilized existing manufacturing facilities that already manufacture other military vehicles. As a result, these facilities already had required air, wastewater discharge, and hazardous waste permits. The facilities also developed safety, hazardous and non-hazardous waste management programs and procedures. Based upon work completed during the production of other vehicle variants, additional work from this phase did not overburden the facilities' existing air emission control equipment and wastewater treatment systems, nor resulted in known reported violations of existing permits. Generated hazardous waste compositions were comparable to other vehicle system programs manufactured at the facilities, and the manufacturing activities did not come in direct contact with biological, cultural or soil resources. There were also no known or reported adverse impacts on the region's socioeconomics or minority or low-income populations due to assembly and integration activities.

Testing, training and fielding installation personnel have the responsibility of preparing site-specific NEPA documentation that addresses environmental impacts on installation specific resources. This PEA includes an analysis of common MRAP impacts to air quality, water resources, hazardous material and waste management programs, non-hazardous waste management programs, soil resources, and noise levels. In these analyses, comparisons regarding MRAP vehicle emissions and maintenance can be made to known installation standard operating procedures, plans and programs.

Vehicle maintenance utilizes similar items and material already used during other ground vehicle maintenance activities, and MRAP vehicle maintenance will not require the use of any unique or new materials. The generation of hazardous and non-hazardous wastes is expected to be comparable to the waste generation rates associated with other ground vehicle systems. Use of spill prevention practices and

response procedures at installations will assist in minimizing any impact to the facility water and soil quality. MRAP noise levels remain consistent with or lower than other currently fielded ground vehicles. Personnel at proposed fielding installations have developed and implemented hazardous and non-hazardous waste management and disposal plans. Based upon these factors, it can be concluded that Army MRAP impacts to the environment related to vehicle maintenance will be minimal at the proposed maintenance installations.

Fielding of MRAP vehicles are currently being conducted OCONUS and CONUS. As defined for this PEA, fielding consists of final MRAP integration in CONUS and required maintenance. Vehicle fielding activities will comply with the proposed installations guidelines and regulations. Materials or compounds used on the MRAP are similar to those materials previously used for other vehicle systems deployed at the installations. MRAP maintenance will require the use of similar items and material already used during other ground vehicle maintenance activities. Disposal of hazardous and non-hazardous wastes would occur through the installations' local procedures. Additionally, vehicle fielding activities do not require unique or new materials. MRAP noise levels would remain below or at current levels for other fielded vehicles. Based upon these factors, it can be concluded that Army MRAP impacts to the environment at the fielding areas will be minimal during fielding.

The Demilitarization and Disposal Plan for the MRAP is currently incomplete but is being developed to follow Department of Defense (DoD) and Joint Service specific guidelines. With the proper disposal of waste streams from the demilitarization activities, it can be expected that those activities would have a minimal impact on the environment.

Conclusion

Based on the analyses contained in this PEA, known and potential impacts of the proposed action on the environment are minor and not adverse, and should not result in any significant adverse impacts or cumulative effects on the human environment. In addition, there are no Executive Order (E.O.) 12898 Environmental Justice concerns since the proposed action does not result in any disproportionately high and adverse human health and environmental effects on minority or low-income populations.

Based upon this analysis, it is determined that the proposed action should not have a significant impact upon the environment. As a result, the preparation of an Environmental Impact Statement (EIS) is not required, and a Finding of No Significant Impact (FONSI) has been prepared and included as Appendix H.

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Acronyms and Abbreviations

Acronym	Title
AAF	Army Air Field
AB	Air Base
ACAT	Acquisition Category
AFB	Air Force Base
APC	Armored Personnel Carrier
AS/AP	Acquisition Strategy/Acquisition Plan
ASN(RDA)	Assistant Secretary of the Navy (Research, Development & Acquisition)
ATC	Aberdeen Test Center
AT&L	Acquisition, Technology & Logistics
ASV	Armored Security Vehicle
BAE-TVS	BAE-Tactical Vehicle Systems
BDAR	Battle Damage Assessment and Repair
CAA	Clean Air Act
CARC	Chemical Agent Resistant Coating
CAT	Category
CATEX	Categorical Exclusion
CBP	Customs Border and Protection
Cd	Cadmium
CENTCOM	Central Command
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CLS	Contractor Logistics Support
COMMARCORSYSCOM	Commander, Marine Corps Systems Command
CONUS	Continental United States
COTS	Commercial Off-The-Shelf
CPD	Capabilities Production Document
CrVI	Hexavalent Chromium
CWA	Clean Water Act
D&D	Demilitarization and Disposal
DA	Department of the Army

Acronym	Title
dBA	Decibel, A weighted
DLA	Defense Logistics Agency
DoD	Department of Defense
DoDI	Department of Defense Instruction
DoN	Department of the Navy
DOT&E	Director, Operational Test and Evaluation
DRMS	Defense Reutilization and Marketing Service
DRMSI	Defense Reutilization and Marketing Service (International)
DT	Developmental Testing
EA	Environmental Assessment
ECU	Environmental Control Unit
EIS	Environmental Impact Statement
EOD	Explosive Ordnance Disposal
EPA	Environmental Protection Agency
ERA	Environmental Resource Area
ESA	Endangered Species Act
ESOH	Environment, Safety and Occupational Health
ESOH-T	ESOH Team
FBI	Federal Bureau of Investigation
FGS	Final Governing Standard
FLMNET	Field Level Maintainer New Equipment Training
FMTV	Family of Medium Tactical Vehicles
FMS	Foreign Military Sales
FNSI/FONSI	Finding of No Significant Impact
FOT&E	Follow-on Operational Testing and Evaluation
FoV	Family of Vehicles
FPII	Force Protection Industries, Inc.
FRP	Full-Rate Production
FSR	Field Service Representative
FUSL	Full-Up System-Level
FY	Fiscal Year
GDLS-C	General Dynamics Land Systems - Canada
GFE	Government Furnished Equipment

Acronym	Title
GWP	Global Warming Potential
HAGA	Heavy Armored Ground Ambulance
HAP	Hazardous Air Pollutant
HHAR	Health Hazard Assessment Report
HMMWV	High Mobility Multipurpose Wheeled Vehicle (HMMWV)
HN	Host Nation
Hp	Horsepower
HST	Home Station Training
IAW	In Accordance With
ICLS	Initial Contractor Logistics Support
I&KPT	Instructor & Key Personnel Training
ICRMP	Integrated Cultural Resources Management Plan
ID/IQ	Indefinite Delivery/ Indefinite Quantity
IOT&E	Initial Operational Testing and Evaluation
IWT	Industrial Wastewater Treatment
ISCP	Installation Spill Containment Plan
JERRV	Joint EOD Rapid Response Vehicle
JLTV	Joint Light Tactical Vehicle
JMVP	Joint MRAP Vehicle Program
JPO	Joint Program Office
JROC	Joint Requirements Oversight Council
JSWSR	Joint Services Weapons Safety Review
JUONS	Joint Urgent Operational Need Statements
LFT&E	Live Fire Test and Evaluation
LOGDEMO	Logistics Demonstration
LUE	Limited User Evaluation
MCAGCC	Marine Corps Air Ground Combat Center
MCAS	Marine Corps Air Station
MCB	Marine Corps Base
MDA	Milestone Decision Authority
MDAP	Major Defense Acquisition Program
MEF	Marine Expeditionary Force
MFT	Material Fielding Team

Acronym	**Title**
MIL-PRF	Military Performance Specification
MIL-STD	Military Standard
MRAP	Mine Resistant Ambush Protected
MTT	Mobile Training Team
NAAQS	National Ambient Air Quality Standards
NCIS	Navy Criminal Investigative Service
NDI	Non-Developmental Item
NEPA	National Environmental Policy Act
NET	New Equipment Training
NPDES	National Polluant Discharge Elimination System
NRMP	Natural Resources Management Plan
OCONUS	Outside Continental United States
ODC	Ozone Depleting Chemical
OEBGD	Overseas Environmental Baseline Guidance Document
OEM	Original Equipment Manufacturer
OJT	On-the-Job Training
OPFOR	Operating Force
OSHA	Occupational Safety and Health Administration
OTC	Oshkosh Truck Corporation
P2	Pollution Prevention
Pb	Lead
PEA	Programmatic Environmental Assessment
PEO	Program Executive Office(r)
PFS	Principal for Safety
POL	Petroleum, Oil and Lubricant
POWT	Publicly Operated Wastewater Treatment
PVI	Protected Vehicles Incorporated
RAM-D	Reliability, Availability and Maintainability-Durability
RCRA	Resource Conservation and Recovery Act
RDC	Rapid Deployment Capability
REC	Record of Environmental Consideration
RFP	Request for Proposal
RSA	Regional Support Activities

Acronym	Title
SAF	Small Arms Fire
SAR	Safety Assessment Report
SON	Statement of Need
SOCOM	Special Operations Command
SOW	Statement of Work
SPAWAR	Space and Naval Warfare Systems Command
SPCCP	Spill Prevention Control and Countermeasures Plan
SSWG	System Safety Working Group
TARDEC	Tank-Automotive Research, Development and Engineering Center
TBS	The Basic School
T&E	Test and Evaluation
TM	Technical Manual
TMDE	Test Measurement and Diagnostic Equipment
UAH	Up-Armored HMMWV
U.S.	United States
USA	United States Army
USAF	United States Air Force
USD	Undersecretary of Defense
USMC	United States Marine Corps
USN	United States Navy
USSOCOM	United States
UT	User Test
UUNS	Urgent Universal Need Statement
VOC	Volatile Organic Compound
V&V	Validation & Verification
YPG	Yuma Proving Grounds

1.0 Introduction

This Programmatic Environmental Assessment (PEA) has been developed by the Army Tank-Automotive Armaments Command (TACOM) LCMC for the Mine Resistant Ambush Protected (MRAP) Joint Program Office (JPO) to meet the Army requirements of the National Environmental Policy Act (NEPA) of 1969 as amended; the President's Council on Environmental Quality (CEQ) Regulations for Implementing NEPA (40 CFR 1500-1508); and Department of the Army (DA) 32 Code of Federal Regulations (CFR) 651 *Environmental Analysis of Army Actions*; Final Rule 29 March 2002, which implements NEPA and CEQ regulations. Though overdue, its purpose is to educate decision-makers during future lifecycle phases, Army fielding facilities, and the public of the expected and any observed environmental consequences of the proposed action and alternatives. TACOM LCMC has conducted a NEPA analyses for the Army family of MRAP vehicles that is being procured and fielded under the direction of the MRAP JPO. The MRAP Vehicle Program is a joint Service program among the United States (U.S.) Army (USA), U.S. Air Force (USAF), U.S. Navy (USN), U.S. Special Operations Command (USSOCOM) and the U.S. Marine Corps (USMC). The USMC has been designated as the lead agency and thus heads the MRAP JPO that is responsible for all MRAP program activities including Environmental, Safety and Occupational Health (ESOH) requirements.

This PEA addresses the expected, and any observed, environmental impacts of the proposed action of production, testing, training, deployment/fielding, and demilitarization/disposal of Army MRAP Vehicles in the Joint MRAP Vehicle Program (JMVP).

1.1 Purpose and Need for JMVP

MRAP vehicles are required to increase survivability and mobility of warfighters in military operations. The immediate need for MRAP vehicles to reduce warfighter casualties, increase survivability, and support counterattack is well documented in multiple Statements of Need (SON), Urgent Universal Need Statements (UUNS), and Joint Urgent Operational Need Statements (JUONS) submitted by Operating Forces (OPFORS) and Central Command (CENTCOM). The JUONS identified the urgent need for a protected vehicle capability that increased survivability and mobility of forces operating in lethal environments.

The USMC, USA, USN, USAF, and USSOCOM identified a mission need to increase survivability and mobility of warfighters operating in hazardous fire areas against known threats. The Joint Staff Rapid Validation and Resourcing Request for MRAP vehicles dated 21 May 2006 and 10 July 2006 stated the urgent need for a vehicle capability that increases survivability and mobility of ground forces operating in a hazardous fire area against known threats. The expanded use of explosives and Small Arms Fire (SAF) requires a vehicle capable of surviving the threat. Ground forces are expected to

respond rapidly, and without a large security contingent. The urgent need calls for a vehicle that enables passengers and crew to survive the enemy attack and then support counter attack.

1.2 Document Scope

The JMVP was based on an urgent need from the field and developed unique development, fielding, and documentation challenges accordingly. This PEA, currently past the completion schedule normally required for traditional Army acquisition programs, is no exception. In addition to the document delay associated with urgent fielding needs, completion of the PEA was further complicated by frequent program changes, numerous system upgrades, and data gathering from a multitude of contractors. The largest of which was the recent program change to field the MRAP in CONUS rather than the initial plan to field only OCONUS for wartime operations, where NEPA requirements are not applicable. Thus, while attempting to capture and present the most current information, most, if not all, program activities have occurred prior to the completion of this PEA. Additional NEPA analysis and corresponding documentation was prepared for these specific activities. This PEA references the previous NEPA documents in their respective sections and provides an evaluation of Army impacts at a programmatic level.

This PEA identifies, documents, and evaluates the direct and indirect effects of the proposed action of testing, training, deploying/fielding, and demilitarizing/disposing of the Army MRAP Family of Vehicles (FoVs) by Environmental Resource Area (ERA). Limited production information and impact evaluation on ERAs was only included when available. No cumulative effects of the proposed action were identified by the Army for discussion in this PEA but are expected to be addressed in individual Army facility-specific NEPA analysis if they are considered significant. Additionally, the PEA addresses the proposed alternative and no action alternative potential impacts and their significance. The ERAs that are analyzed in this PEA are those affecting the human environment applicable to all (or nearly all) locations (worldwide) where life cycle activities of the MRAP vehicles would occur. These ERAs include soils, land use, cultural resources, air quality, water quality, noise, solid waste, biological resources, hazardous materials and hazardous waste management, aesthetic and visual resources, socioeconomics, and health and safety. The potential environmental consequences of the Army MRAP vehicles are identified and analyzed in this document.

This PEA evaluates general use of the Army MRAP vehicles to include test activities at existing areas, training activities on existing ranges, and vehicle maintenance in work areas following written instructions. Some MRAP Program activities or unique environmental conditions may necessitate further evaluation of site-specific ERAs. Testing, fielding and training installation personnel are responsible for determining whether additional site-specific NEPA documentation is required. Since each of the

Services (USA, USAF, USN, and USMC) has their own implementing regulations for NEPA, installation personnel will comply with their Service specific requirements when completing any necessary site-specific NEPA documentation. A site-specific environmental analysis can be accomplished through a Categorical Exclusion (CATEX), if applicable; a Record of Environmental Consideration (REC), if a REC is applicable and other documentation is sufficient; a supplemental Environmental Assessment (EA), if specific issues need further analyses; or an Environmental Impact Statement (EIS), if site-specific impacts appear significant. JPO MRAP will provide installation personnel with any required and requested system information in support of their service or facility specific NEPA analysis and documentation preparation. In any case, the Army analyses within this PEA need not be duplicated, but can be incorporated by reference.

For this PEA, the proposed action and alternatives will be evaluated using three types of impact categories.

1. An insignificant impact would result from an action that would have no noticeable impact to the resource area.
2. A minimal impact would result from an action that would have an impact on the resource area, but the impact would be temporary and managed through the use of existing plans and resources.
3. A significant impact would result from an action that would have an impact on the resource area that cannot be rectified or would result in a facility or installation in violation of its permits.

It should be noted that significant changes to future configurations of the MRAP vehicles that are not addressed in this PEA may require further Army NEPA analysis and documentation either in the form of a supplemental EA, REC, CATEX or EIS. Once this PEA has been completed, its findings will be published in a public notice and be available for public review.

2.0 Description of the Proposed Action

2.1 MRAP Program Description

The Department of the Navy (DoN) is the MRAP Vehicle Program Executive Agent, and the Commander, Marine Corps Systems Command (COMMARCORSYSCOM) functions as the MRAP Vehicle Program Executive Officer (PEO). The Undersecretary of Defense (USD), Acquisition Technology and Logistics (AT&L) is the Milestone Decision Authority (MDA) within USN/USMC Command Structure.

The JMVP is a unique acquisition program that evolved from a small Rapid Deployment Capability (RDC) component program to a Joint Acquisition Category (ACAT) ID Major Defense Acquisition Program (MDAP) in a matter of months. The Secretary of Defense

has designated the JMVP as Department of Defense’s (DoD) highest priority acquisition program. The production capacity of multiple manufacturers employing Commercial Off-The-Shelf (COTS) technology is being leveraged to meet the program's overarching objective of producing and fielding the maximum number of survivable, safe and sustainable MRAP vehicles in the shortest period of time. Unlike traditional acquisition programs, MRAP proposed actions were carried out prior to the completion and approval of some of the acquisition documentation, including this PEA, to meet wartime demands.

On 9 November 2006, the USMC awarded a sole source Indefinite Delivery/Indefinite Quantity (ID/IQ) contract to Force Protection Industries, Incorporated (FPII) for up to 200 Category (CAT) II vehicles (Cougar) and up to 80 CAT III vehicles (Buffalo) to expedite deliveries to theater while a competitive procurement continued for the remaining vehicles.

Concurrently, the USA and USMC released a competitive Request for Proposal (RFP) for CAT I vehicles and the bulk of CAT II vehicles. On 26 January 2007, ID/IQ contracts were awarded to nine manufacturers that initially demonstrated capabilities to meet the program's stated objectives. The nine manufacturers are listed in Table 1. Eight of the nine Original Equipment Manufacturers (OEMs) provided MRAP vehicles as test assets.

Table 1. Nine MRAP Manufacturers

Manufacturer	Variant	Test Units	Production Units
BAE Systems	CAT I RG33	X	X
	CAT II RG33L	X	X
	Heavy Armored Ground Ambulance (HAGA)	X	X
BAE-Tactical Vehicle Systems (TVS) (formerly Armor Holding)	CAT I Caiman	X	X
	CAT II Caiman	X	X
Force Protection Industries, Inc. (FPII)	CAT I Cougar	X	X
	CAT II Cougar 6x6	X	X
	CAT III Buffalo	X	X
General Dynamics Land Systems – Canada (GDLS-C)	CAT I RG31 Mk 5E	X	X
	CAT II RG31 Mk 5E	X	
Navistar Defense (formerly	CAT I MaxxPro	X	X

International Military and Government)	CAT II MaxxPro	X	
Oshkosh Truck Corporation	CAT I Alpha	X	
	CAT II Bushmaster	X	
	M-ATV	X	X
Protected Vehicle Incorporated (PVI)	CAT I Golan	X	
	CAT II Golan	X	
Textron Marine and Land Systems	CAT I XM1117 Armored Security Vehicle (ASV)	X	
	CAT II XM1117 ASV	X	
General Purpose Vehicle	None delivered		

Based on preliminary testing, the MRAP JPO selected five OEMs from the original nine to produce additional vehicles. During down selection, the JPO determined that these five OEMs' variants were the only vehicles able to satisfy JPO requirements to support Joint Forces. The OEMs selected were BAE Systems, BAE-Tactical Vehicle Systems (BAE-TVS), Force Protection Industries, Inc (FPII), Navistar Defense, and General Dynamics Land Systems-Canada (GDLS-C). After production of the selected variants neared completion, the JPO determined the MRAP-All Terrain Vehicle (M-ATV) from Oshkosh was also needed to satisfy changing mission requirements. In April 2009, Oshkosh was awarded a production contract.

The JPO has established an Environment, Safety, and Occupational Health-Team (ESOH-T) with representatives from each of the Services to centralize all ESOH efforts and provide the JPO with a consolidated resource to efficiently manage and address ESOH issues across Service boundaries. The overarching ESOH goal of the JMVP is to deliver systems that can be tested, operated, maintained, repaired and disposed of with minimal risk to people, equipment and the environment. ESOH hazards are being identified, assessed and eliminated or mitigated to acceptable levels. Residual risks are formally accepted at the appropriate level IAW DoD and Service specific policies and guidance, and in coordination with the designated user community prior to exposing people, equipment or the environment to known system-related ESOH hazards. Identified ESOH hazards will be documented and tracked by the MRAP JPO throughout the life of the vehicles.

2.2 MRAP System Description

The MRAP FoVs consists of 7 armored vehicle variants produced by multiple OEMs. These vehicles provide enhanced protection in current and future conflicts. Other

variants were developed from each of these base variants to incorporate mission specific capabilities. In addition, different configurations of each variant were required to address service specific equipment requirements. Since the main difference between configurations is the Government Furnished Equipment (GFE) used, it was assumed that potential environmental impacts would be similar or the same amongst configurations of the same variant.

The MRAP uses a heavy-duty diesel truck chassis and powertrain. The MRAP vehicles provide a range of variants to fulfill an immediate need for protected transport capability. The MRAP vehicles operate over a variety of terrain that includes limited off-road operation across firm soil and obstacles such as debris, but will travel primarily on hard-surface or unimproved roads. Vehicles operate across the range of weather conditions encountered in current operational theaters. Vehicles are equipped with the appropriate communications, displays, sensors and information systems necessary for operations in a network environment. Initially, these systems were largely the same as those that currently equip the Joint Tactical Wheeled Vehicle Force.

There are three MRAP vehicle categories (CATs) supporting the following missions:

1. CAT I - Urban combat operations.
2. CAT II - Multi-mission operations (convoy lead, troop transport, ambulance).
3. CAT III - Mine/explosive clearance operations and explosive ordnance disposal.

The CAT I MRAP vehicle must be capable of supporting operations conducted in an urban environment, and transporting no less than six personnel. The CAT II MRAP vehicle must support multiple missions, to include convoy operations, troop transport missions, ambulance missions, and explosives for maneuver battalions; while transporting up to 10 personnel. The CAT III vehicle supports mine and explosives clearance missions with a capability of transporting no less than six personnel.

MRAP vehicles also include provisions for employment of individual weapons by mounted troops (e.g. firing ports in SOCOM variants) as well as mounting and employment of heavier weapons such as medium and heavy machine guns and future addition of a tactical missile launcher capability. Weapon mount design includes protection for gunners against the effects of enemy weapons.

The MRAP variants contain Government Furnished Equipment (GFE). This includes communications equipment, radios, navigation systems, and other common command and control subsystems. The equipment is already in the current force inventory.

The vehicles have air conditioners/Environmental Control Units (ECUs) that utilize R-134a as a refrigerant. The vehicles contain manual and/or automated fire suppression systems that use a variety of non-ozone depleting chemical fire suppressants. Appendix C contains a list of the fire suppressants used in each MRAP variant.

Appendix A contains detailed information on the physical vehicle characteristics of each variant, and Appendix D contains a list of vehicle fluids for the individual variants. The following provides a brief description of each of the variants.

2.2.1 BAE–TVS: Caiman

The Caiman are CAT I and II MRAP vehicles produced by BAE-TVS (formerly Armor Holdings Aerospace and Defense Group), in Sealy, TX. These variants are 6x6 COTS vehicles designed from the Family of Medium Tactical Vehicles (FMTV) chassis. The Caiman vehicles utilize a Caterpillar C-7 330 horsepower (hp) engine. Figure 1 shows the Caiman variant. Both CAT I and II vehicles were purchased for initial test. Only the CAT I variant was chosen for additional production.

Figure 1. BAE-TVS: Caiman Vehicle

2.2.2 BAE Systems: RG33, RG33L, and Heavy Armored Ground Ambulance (HAGA)

The RG33 MRAP vehicles produced by BAE Systems in Santa Clara, CA are existing COTs vehicles. The RG33 and RG33L MRAP vehicles are armored vehicles with a blast resistant V-shaped underbody designed to protect the crew from mine blasts, fragments and direct fire weapons. The CAT I vehicle is being used by the USA and USSOCOM. The CAT II vehicle is being used by the USA.

The RG33 is a CAT I 4x4 vehicle and the RG33L is a CAT II 6x6 vehicle. There is a cupola on the top front of the crew compartment capable of accommodating a variety of weapons. The BAE Systems variants use a Cummins ISL 400 hp engine.

The HAGA is built from the base RG33L vehicle. Modifications to the vehicles allow for in route care for a mixture of patients both ambulatory and litter bound. The HAGA is being used by the USMC and the USA. Figure 2 shows the three BAE variants referred to above.

Figure 2. BAE Systems: RG33, RG33L and HAGA

2.2.3 FPII: Cougar and Buffalo

The Cougar and Buffalo vehicles produced by FPII in Ladson, SC are COTS vehicles. The CAT I Cougar is a 4x4 drive vehicle, the CAT II Cougar is a 6x6 drive vehicle and the CAT III Buffalo is a 6x6 drive vehicle. The Cougar variants contain Caterpillar C-7 330 hp engine, and Buffalo uses a Mack A1-400 Diesel 400 hp engine.

The CAT I and CAT II vehicles are being used by all the Services. The CAT III Buffalo are being used by the USMC. Figure 3 shows the FPII variants referred to above.

Figure 3. FPII: Cougar 4x4 and 6x6 Variants and the Buffalo

2.2.4 GDLS-C: RG31 Mk 5E

The RG31 Mark 5E (extended hull) MRAP vehicle produced by GDLS-C in London, Ontario is a COTS system. Both CAT I and CAT II RG31 vehicles were purchased for testing but only additional CAT I RG31 Mark 5E vehicles were purchased. The CAT I MRAP RG31 Mk5E is a four wheel, 4x4 vehicle intended for both on and off road use. The RG31 Mk5E utilizes a Cummins QSB FR91421 engine. The USA and USSOCOM use the RG31 Mk5E, shown in Figure 4.

Figure 4. GDLS-C: RG31 Mk 5E

2.2.5 Navistar Defense LLC: MaxxPro

The MaxxPro CAT I MRAP vehicles produced by Navistar Defense LLC (formerly International Military and Government) in Warrenville, IL are COTS vehicles. Both CAT I and CAT II G31 vehicles were purchased for testing but only the CAT I MaxxPro will enter into production. The CAT I MaxxPro has a 4x4 drive and utilizes a two-door cab. The MaxxPro contains an International DT530 Engine. The MaxxPro vehicle shown in Figure 5 is being used by the USA and USAF.

Figure 5. IMG: MaxxPro

2.2.6 Oshkosh Truck Corporation: Alpha, Bushmaster, and M-ATV

The CAT I Alpha, CAT II Bushmaster, and M-ATV vehicles are produced by Oshkosh Truck Corporation (OTC) in Oshkosh, WI (See Figure 6). In order to meet the planned production schedule, M-ATV production also took place concurrently at JLG Industries in McConnellsburg, Pennsylvania. These MRAP vehicle design includes features that provide crew/occupant protection against direct fire and mine blast.

The CAT II Bushmaster is a medium protected vehicle intended primarily for use in point, route and area clearance of mines explosives. Although some Alpha and Bushmaster vehicles were purchased early in the MRAP program, additional vehicles were not purchased. Alpha and Bushmaster vehicles purchased under the MRAP program are planned to be transferred to the Navy Criminal Investigative Service (NCIS).

The M-ATV is a multipurpose, four wheel, 4x4 vehicle intended for both on and off road use that will carry up to five personnel. The M-ATV uses a 370 hp Catepillar C-7 engine and has the TAK-4 independent suspension system (ISS) for increased traction and mobility. A centrally inflated run-flat tire system allows for travel even if tires lose pressure. The M-ATV is being used by the all the joint services.

Figure 6. Oshkosh: Alpha, Bushmaster, and M-ATV

2.2.7 PVI Golan

The CAT I and CAT II Golan 4x4 vehicles (See Figure 7) produced by PVI in North Charleston, SC was designed under the classification of a Tactical Wheeled Vehicle for ballistic protection. Although some CAT I PVI vehicles were purchased early in the MRAP program, additional vehicles will not be purchased. The vehicles from PVI were transferred to the Federal Bureau of Investigation (FBI) and the U.S. Customs Border and Protection (CBP).

Figure 7. PVI: Golan

2.2.8 Textron Marine and Land Systems: XM1117 ASV

The Textron Model XM1117 Armored Security Vehicle (ASV) (See Figure 8) are CAT I and CAT II light armored combat wheeled vehicles. The ASV is an Urban Patrol, Reconnaissance and Command and Control Vehicle already fielded to the USA. Although some XM1117's were purchased early in the MRAP program, additional vehicles will not be purchased. The purchased test vehicles were returned to the vendor.

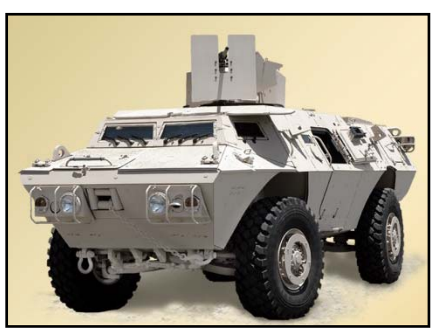

Figure 8. Textron: XM1117 ASV

2.2.9 GPV Vehicles

Although a contract was awarded to GPV, the JPO did not order any GPV Vehicles**.**

2.3 Vehicle Testing

Following award of the basic ID/IQ contracts, the government immediately ordered test vehicles from eight of the nine vehicle manufacturers, as shown in Table 2.

Table 2. Test Vehicles by Manufacturer

Manufacturer	Variants	Total Test Vehicles
BAE Systems	CAT I RG33, CAT II RG33L & HAGA	28
BAE-TVS	CAT I Caiman & CAT II Caiman	20
FPII	CAT I Cougar, CAT II Cougar 6x6 & CAT III Buffalo	44
GDLS-C	CAT I RG31 Mk 5E & CAT II RG31 Mk 5E	24
Navistar Defense LLC	CAT I MaxxPro & CAT II MaxxPro	24
GPV	None Delivered	0
OTC	CAT I Alpha, CAT II Bushmaster, & M-ATV	99
PVI	CAT I Golan & CAT II Golan	4
Textron Marine and Land Systems	CAT I XM1117 ASV & CAT II XM1117 ASV	4

The Test and Evaluation (T&E) strategy developed and implemented for the JMVP focused on accelerated T&E of CAT I and CAT II MRAP vehicles. The test strategy for CAT I and CAT II vehicles reflected the urgency of the mission need and compressed acquisition schedule and emphasis on specific survivability and mission criteria. The testing includes a combination of both developmental and operational tests.

Each MRAP vehicle has been evaluated for its ability to meet specific survivability, mobility, automotive, and safety requirements detailed in test plans. Per Assistant Secretary of the Navy (Research, Development & Acquisition (ASN(RDA)) guidance, all T&E activities, including Live Fire Test and Evaluation (LFT&E), has been coordinated with the Director of Operational Test and Evaluation (DOT&E) and the Director of LFT&E.

2.3.1 Developmental Tests

Initial Developmental Testing (DT) phases were designated as DT-C1, DT-C2, and DT-C3 in accordance with DoD guidance. DTs occurred at Aberdeen Test Center (ATC) and at Aberdeen Proving Ground (APG), MD.

DT-C1 included an initial Limited User Evaluation (LUE) test phase, and was used to evaluate survivability/vulnerability issues (including LFT&E), mobility issues, structural integration issues, and to identify other automotive and vehicle limitations unique to each MRAP design. DT-C1 was conducted from 2nd Quarter FY 07 – 3rd Quarter FY 07. A total of 36 vehicles (two of each variant were provided) were tested at ATC. A REC was prepared by the USA to meet NEPA requirements for testing that occurred during DT-C1.

DT-C2 testing occurred on MRAP vehicles equipped will all GFE suites. This testing included additional armor coupon testing and addressed data voids identified in DT-C1. DT-C2 was conducted 3rd Quarter FY07 – 2nd Quarter FY08 and included 38 vehicles. A REC was prepared by the USA to meet NEPA requirements for the testing that occurred during DT-C2.

DT-C3 testing evaluated Reliability, Availability and Maintainability-Durability (RAM-D), operation in environmental extremes, other MRAP specification requirements not previously tested, and any improvements to MRAP capabilities. DT-C3 also constituted the Full-Up System-Level (FUSL) test phase for the program and included some ballistic and LFT&E. DT-C3 occurred from 2nd Quarter FY08 –1st Quarter FY09 and included 29 vehicles. A REC was prepared by the USA to meet NEPA requirements for the automotive testing that occurred during DT-C3.

2.3.2 Operational Test and Evaluations

Initial Operational Test and Evaluation (IOT&E) occurred at Yuma Proving Ground (YPG) from 1st Quarter 2008 – 3rd Quarter 2008 and included 49 vehicles. The IOT&E evaluated, verified and validated the accomplishment of specific performance capabilities for the varying MRAP vehicle systems selected for Full Rate Production (FRP) and ensured that technical risks, including safety risks, had been sufficiently mitigated. A total of eight MRAP vehicles underwent IOT&E at YPG.

Follow-On Operational Testing and Evaluation (FOT&E) on production representative vehicles was conducted, as required by statute and regulation. Modifications to the vehicles were tested during FOT&E. Significant modifications to the vehicles are currently being evaluated to determine what additional NEPA analyses are required, if any.

RECs were prepared for operational testing events that occurred at YPG in accordance with 32 CFR 651. The RECs stated that the environmental impacts of MRAP test activities have been sufficiently addressed in the Range Wide Environmental Impact Statement for YPG dated July 2001.

2.3.3 Logistics Test Program

The FoV underwent a logistics demonstration (LOGDEMO) as part of applicable test events, to verify operator and maintenance tasks and capture projected annual maintenance man-hour data. Validation and Verification (V&V) of Technical Manuals were required to support the LOGDEMO.

MRAP vehicle activities are required to comply with federal, state and local environmental laws and regulations. In this regard, personnel at each USA test installation have the responsibility for obtaining all necessary air emission permits, wastewater discharge permits and other environmental permits that may be applicable to MRAP test activities. Installation personnel at testing facilities must ensure that appropriate site-specific NEPA analysis is conducted prior to initiation of MRAP testing activities. It is the responsibility of the JPO to provide testing installations with any required and requested information in support of this analysis and document preparation.

2.4 Vehicle Production

As described in Section 4.1, the JPO selected six OEMs to manufacture MRAP variants. These six OEMs provided production variants to each Service and USSOCOM as shown in Table 3.

Table 3. MRAP Variants by Service

Manufacturer	Variant	USMC	USA	USN	USAF	USSOCOM
BAE Systems	CAT I RG33		X			X
	CAT II RG33L		X			
	HAGA	X	X			
BAE-TVS	CAT I Caiman		X			
	CAT II Caiman		X			
FPII	CAT I Cougar	X	X	X	X	
	CAT II Cougar 6x6	X	X	X	X	
	CAT III Buffalo	X				
GDLS-C	CAT I RG31 Mk 5E		X			X
Navistar Defense	CAT I Maxx Pro		X		X	
	CAT II		X			
OTC	M-ATV	X	X	X	X	X

The requirements for Joint MRAP vehicles across the Services grew from an initial 1,185 vehicles to 7,774 vehicles cited in the Joint Requirements Oversight Council (JROC) validated Capabilities Production Document (CPD) of May 2007, to an interim requirement of 15,838 vehicles validated in July 2008. As of November 2010, 26,767 MRAP vehicles have been fielded. 19,409 of which are USA assets. Initial Contractor Logistics Support (ICLS) will continue to provide a means for MRAP sustainment and operation until DoD Logistic support capabilities are fully established.

The final production facilities' locations are as follows:
- BAE-TVS: Sealy, TX
- BAE Systems: Santa Clara, CA
- FPII: Ladson, SC
- GDLS-C: London, Ontario
- Navistar Defense LLC: Warrenville, IL
- OTC: Oshkosh, WI & JLG Industries McConnellsburg, PA

Production facilities located within the U.S. are required to comply with federal, state and local environmental laws and regulations. In this regard, each manufacturing facility is responsible for obtaining all necessary air emission permits, wastewater discharge permits and other environmental permits that may be applicable to MRAP production/manufacturing activities.

The Government has also established a GFE integration facility at the Space and Naval Warfare (SPAWAR) Systems Center, Charleston, SC. The integration of Service unique systems onto the various MRAP vehicles occurs at the SPAWAR System Center. The manufacturers delivered vehicles to SPAWAR for integration with GFE and preparation for shipment prior to transport.

2.5 Vehicle Training

MRAP vehicle operators and maintainers will require certain system-specific training. In order to support immediate operations, training is currently being conducted using Contractor Logistics Support (CLS) (i.e. contractors rather than government personnel provide training) both within Continental United States (CONUS) and Outside Continental United States (OCONUS). In the future, training is planned to transition from CLS to organic DoD support.

Currently, to support theater operations, contractors provide User Test (UT) Training and New Equipment Training (NET). They also provide operator and maintainer course curricula. NET includes all critical (core) operator, crew and maintainer tasks using appropriate manuals, tools and support equipment. Maintainer training in the near term will consist of On-the-Job Training (OJT) monitored by Field Service Representatives (FSRs) in theater. Contractors will conduct additional instructor,

operator, crew, maintainer and leader training, as required. Courses include safety and hazard instruction.

Until this point, the majority of training activities have occurred in theater. However, Services have begun to conduct Home Station Training (HST) as well. Initial HST took place in 2007 and is referred to as Phase I HST. During Phase I HST, BAE RG31 training assets were fielded to USSOCOM and FPII CAT I, II Cougars and CAT III Buffalos were fielded to the USMC and USN. Follow-on HST fielding is currently taking place and is referred to as Phase II HST. In support of Phase II HST training, USMC and USN units will receive FPII CAT I, II Cougars and CAT III Buffalos. The USAF will receive FPII CAT I and II Cougars and Navistar Defense Cat I MaxxPros. A total of approximately 1800 vehicles are planned for fielding to the HST locations shown in Tables 4 and 5 below.

Table 4. MRAP Phase I HST Locations

Service	Organization
USMC	Marine Corps Base (MCB) Camp Pendleton, CA
USMC	MCB Camp Lejeune, NC
USMC	Kaneohe Bay, HI
USMC	Marine Corps Air Station (MCAS) Yuma, AZ
USMC	MCB Quantico, VA
USMC	Marine Corps Air Ground Combat Center (MCAGCC) Twentynine (29) Palms, CA
USN	Naval Construction Battalion Center, Gulfport, MS
USN	Naval Construction Bataillon Center, Port Hueneme, CA
USSOCOM	USSOCOM

Table 5. MRAP Phase II HST Locations

Service	Organization
USAF	Tyndall Air Force Base (AFB), FL
USAF	Eglin AFB, FL
USAF	Moody AFB, GA
USAF	Pope AFB, NC
USAF	McGuire AFB, NJ
USAF	Fort Hood, TX
USAF	Fort Bliss, TX
USAF	Lackland AFB, TX
USAF	Spangdahlem Air Base (AB), Germany
USAF	Nellis AFB, NV
USAF	Kadena AB, Japan
USAF	Andersen AFB, Guam

Service	Organization
USAF	Fort Lewis, WA
USAF	Salina ANG, KS
USAF	Ramstein AB, Germany
USAF	Malmstrom, MT
USAF	Hulburt Field, FL
USAF	Hickam AFB, HI
USAF	Carswell ARS, TX
USAF	Eilson AFB, AK
USAF	F.E. Warren AFB, WY
USMC	MCB Camp Lejuene, NC
USMC	MCB Camp Pendleton, CA
USMC	Twentynine Palms, CA
USMC	Kaneohe Bay, HI
USMC	Camp Fuji, Japan
USMC	Camp Kinser Okinawa, Japan
USMC	Red River Army Depot, Texarkana, TX
USN	China Lake, CA
USN	Fort Story, VA
USN	Guam
USN	Gulfport, MS
USN	Port Hueneme, CA
USN	Tidewater, VA
USA	Camp Atterbury, IN
USA	Camp Shelby, MS
USA	Fort Bragg, NC
USA	Fort Campbell, KY
USA	Fort Carson, CO
USA	Fort Dix, NJ
USA	Fort Drum, NY
USA	Fort Hood, TX
USA	Fort Irwin, CA
USA	Fort Lewis, WA
USA	Fort McCoy, WI
USA	Fort Polk, LA
USA	Fort Riley, KS
USA	Fort Sill, OK
USA	Fort Stewart, GA
USA	Fort Wainwright, AK
USA	Hohenfels, Germany
USA	Red River Army Depot, TX

Service	Organization
USA	Schofield Barracks, HI

In addition to the HST mentioned above, some specific MRAP training activities were performed during Mojave Viper, a training exercise held in 29 Palms and Marine Corps Air Station (MCAS) Yuma. This exercise with the battalion was performed in scenarios in a simulated urban environment. Additional training exercises were performed at MCAS Yuma Marine Expeditionary Force (I MEF); Camp Pendleton, CA; II MEF, Camp Lejeune, NC; Marine Corps Base Quantico, VA; The Basic School (TBS); and Marine Corps Base Hawaii at Kaneohe Bay.

As mentioned previously, most, if not all, activities related to this program have already taken place, including training events. The following provides information on NEPA documentation prepared in support of these training events:

- A CATEX for the HST using the MRAP FPII variant was prepared by the USMC for TBS Quantico, MCB Hawaii Kaneohe Bay, I MEF, and II MEF. The CATEX used for this activity is defined in 32 CFR 775.6 (f) (45). A CATEX is deemed as an action based on past experience with similar actions that do not individually or cumulatively have any significant environmental impact. CATEXs are defined in the 40 CFR 1508.4.
- A CATEX, dated 28 August 2007, was prepared for military training at Camp Billy Machen, MCAS Yuma to conduct live fire testing and training for four training exercises in 2007 and seven exercises for 2008 referred to as “mobility training.” The CATEX used for this activity is defined in 32 CFR 775.6 (f) (45).
- A third CATEX, dated April 2008, was completed for HST of USA, USAF, USMC, and USN personnel at I MEF, II MEF, III MEF, Marine Corps Base Camp Lejeune, and Marine Corps Air Ground Combat Center Twentynine Palms with MRAP FPII vehicles. The CATEX used for this activity is defined in 32 CFR 775.6 (f) (45).

In addition to training occurring in the field, JPO established a centralized location, called the MRAP University at Red River Army Depot, TX for training. Training classes at MRAP University include Field Level Maintainer New Equipment Training (FLMNET) and cross training of FSRs and Government personnel. The MRAP University training concept begins in the classroom, transitions to a hands-on vehicle training and concludes with both a day and night driving course. The MRAP University also includes a CONUS Mobile Training Team (MTT) to provide unit commanders a flexible means of providing their personnel with MRAP NET. The MTT personnel team consists of a mix of government civilians, contractors, military support contractors (third party) and on-call Red River Army Depot support personnel.

The JPO is working with Service training and education organizations to develop a long-term training and facilities strategy to support future CONUS training requirements. In

the future, OEM personnel will conduct operator and maintainer Instructor and Key Personnel Training (I&KPT) to support transition from contractor provided training to a Government training capability. Vehicle manufacturers will conduct operator and maintainer I&KPT at respective facilities. After transitioning to government support, training will be accomplished by leveraging existing or future institutional and unit training programs with the addition of tailored MRAP vehicle simulation/simulators and NET. In support of institutional training existing training facilities will be modernized to address MRAP unique characteristics and requirements. As the Training Support Plan is solidified, these details will be provided in future updates.

MRAP vehicle activities at each installation are required to comply with federal, state and local environmental laws and regulations. In this regard, personnel at each training installation have a responsibility for obtaining all necessary air emission permits, wastewater discharge permits and other environmental permits that may be applicable to MRAP training activities. Except for the modernization of existing facilities, it is not currently anticipated that training requirements for the MRAP system will increase infrastructure requirements at training locations. However, if infrastructure expansion or other activities of significant impact are later deemed necessary, installation personnel at training facilities must ensure that the appropriate NEPA analysis is conducted prior to initiation of MRAP training activities. It is the responsibility of the JPO to provide training installations with any required and requested information in support of this analysis and document preparation.

2.6 Vehicle Fielding

The JPO has the responsibility for fielding of the MRAP vehicles. MRAP fielding consists of final preparation of the vehicles prior to shipment as well as support and maintenance activities after the units receive the vehicles. Integration of the GFE and preparation of the MRAP vehicles for shipment occurs at SPAWAR System Center, Charleston, SC. MRAP vehicle are fielded to various CONUS and OCONUS locations.

MRAP deprocessing activities occur as part of vehicle fielding. Deprocessing activities by the Material Fielding Team (MFT) includes the necessary maintenance activities and final integration of MRAP vehicle components. The deprocessing activities occur prior to the military units receiving the MRAP vehicles.

The MRAP vehicles are transported by highway, rail, air and sea. Highway transport is accomplished by a semi-truck and trailer. The MRAP vehicles are transportable on all strategic marine transport vessels for worldwide deployments.

The JPO intends to support the MRAP FoV with an ICLS approach for a period of 12 to 24 months, which will include the use of a combination of OEM and Government FSRs. The CLS FSRs provide MRAP maintenance guidance, supply, OJT and logistics support. ICLS includes commercial operator and maintenance manuals; limited on board diagnostics;

field and sustainment level logistics support; field and sustainment level vehicle maintenance and repair; parts analysis; procurement; tracking; inventory management; storage; and distribution. The Services are working to develop optimal joint, long-term strategies for support. Initial support is planned to transition from ICLS to a hybrid support system (consisting of ICLS/Government capabilities) and for some of the Services, may transform into a fully Government support strategy.

The vehicle manufacturers provided COTS operator and maintenance manuals and supplements, developed IAW Military Performance Specification (MIL-PRF) 32216, to support MRAP vehicles.

Maintenance is accomplished IAW standard service maintenance systems. All Services using the MRAP vehicles employ the following maintenance levels on the MRAP vehicles.

- Operator/Crew Level Maintenance (Organizational) is performed to sustain and maintain equipment in a mission capable status and is both preventative and corrective in nature. Operator/crew level maintenance entails inventory, cleaning, inspecting, preserving, lubricating, adjusting, testing and replacing parts and components with common shop tools.
- Field Level Maintenance (Intermediate) is conducted to return equipment to a mission capable status. Field level maintenance actions include inspection/in-depth diagnosis, modification, replacement, adjustment and limited repair or evacuation/disposal of principal end items and their selected repairables and components/sub-components. Field maintenance also includes calibration and repair of Test Measurement and Diagnostics Equipment (TMDE), as well as fabrication of items, precision machining and various methods of welding. Initial field maintenance will be accomplished via ICLS and later by organic support or contractors.
- Sustainment Level Maintenance (Depot) includes performing major repair, overhaul or complete rebuild of parts, subassemblies, assemblies or principal end items. It also includes painting of vehicles, manufacturing parts and conducting required modifications, testing, calibrating and reclaiming. Sustainment level maintenance may be performed at multi-commodity maintenance centers, other Service depots, commercial industrial facilities or a combination thereof. Minor sustainment maintenance and Battle Damage Assessment and Repair (BDAR) will take place at the Regional Support Activities (RSAs) that will be determined at a later date.

Installations where the MRAP system will be fielded are required to obtain appropriate environmental permits that address the potential environmental impacts the system may have on the local environment such as wastewater discharge permits, storm water permits, hazardous waste disposal permits, air emission permits, etc. In addition, it is the responsibility of receiving installation personnel to ensure that appropriate NEPA

analysis and documentation is in place to address the fielding and deployment activities of the MRAP system. Additional installation NEPA analyses may be necessary if fielding activities result in significant environmental impacts that are not covered or described adequately in this document. It is the responsibility of the JPO to provide fielding installations with any required and requested information in support of any analysis and document preparation.

2.7 Vehicle Demilitarization and Disposal (D&D)

At the end of its useful life, all MRAP vehicles will undergo D&D. Demilitarization is the act of rendering equipment's defensive or offensive capabilities unusable by hostile forces. Disposal includes destroying, selling, recycling, transferring, abandoning, donating, redistributing or any other means of disposal. Currently, no date for the demilitarization and disposal of the entire MRAP FoV had been proposed. When a date for D&D becomes available, a future NEPA analysis will be conducted to determine any impact to the environment.

The vehicle demilitarization and disassembly will follow the MRAP FoV Demilitarization and Disposal Plan, currently under development, as well as the DoD 4160.21-M, *Defense Reutilization and Disposal,* and DoD 4160.21-M-1, *Defense Demilitarization Manual*. Each of the variants has a detailed D&D description located in the MRAP D&D Plan.

3.0 Proposed Alternatives

Determining the best systems acquisition approach for an MRAP vehicle involved examination of alternative concepts such as opportunities to modify allied systems, use of non-developmental items (NDI) and COTS items, and starting a program from the concept phase to develop technology.

Numerous "Sources Sought Announcements" were issued and technical and operational experts from the Services and USSOCOM regularly attend symposiums, industry conferences and technical interchange meetings on ballistic hardened and mine protected vehicles.

3.1 Preferred Alternative

For all the Services, the preferred alternative was the proposed action; the production, testing, training, fielding, and D&D of the MRAP FoV, as defined in Section 2.0. This COTS program complements other materiel and non-materiel solutions to mitigate the capability gaps identified in this document. Market research provided a clear path to existing COTS technology to satisfy the urgent need for a vehicle which provided increased survivability and mobility. The COTS approach enabled the JPO to quickly procure vehicles leveraging the commercial technology investments of the private

sector, realize faster new technology insertion, and lower life cycle costs. For this reason, the MRAP vehicle program is the only current viable technical alternative for various Joint Forces applications that at the same time meets the urgent need requirements.

3.2 Alternatives Considered but Eliminated

The Joint Services evaluated current Operating Force (OPFOR) vehicles such as a modified and improved High Mobility Multi-purpose Wheeled Vehicle (HMMWV) and the Up-Armored HMMWV (UAH). The modified HMMWV and UAH did not meet survivability requirements as defined in the UUNS and JUONS. As a result, the modified HMMWV and UAH were eliminated from future consideration in the MRAP Program.

Also considered was the Joint Light Tactical Vehicle (JLTV). The JLTV program is still in the design phase and is planned for future use. As a result, the JLTV would not meet the immediate needs of the current OPFOR.

It was determined through market research that the MRAP vehicle program provides a capability to augment the UAH and the JLTV. MRAP vehicles do not replace these programs. MRAP vehicles provide greater protection to crew and passengers, and increased vehicle survivability over the current UAH fleet.

3.3 No Action Alternative

The no action alternative considered was that the MRAP would not be procured. Thus, production, testing, training, deployment/fielding and demilitarization/disposal of the MRAP vehicles would not occur. The no action alternative would consist of the continuation of current ballistic protection capabilities utilizing existing Joint OPFOR's equipment and personnel.

The no action alternative did not meet the urgent mission need for a protected vehicle with increased survivability and mobility. Therefore, it was eliminated from consideration. While the no action alternative was eliminated, this PEA contains an analysis of the no action alternative's environmental impacts for comparison with the proposed action.

4.0 Affected Environment

The affected environment includes the production, testing, training, fielding and D&D locations as described in Section 2.0. These locations contain Environmental Resource Areas (ERAs). A general description of the ERAs follows in the sections below.

Soil resources include the soils and minerals that overlay bedrock and other parent material. Soils can be defined in terms of their complex types and physical characteristics. Each installation and facility associated with the MRAP Program has its unique soil resources. Likewise, the installations have programs and spill prevention and containment plans that reduce or eliminate impacts to the local soil resources. Land use can be identified as the planned development of property to achieve the highest and best use of the land. In addition, land use planning should occur to ensure usage compatibility with the surrounding land. Installations that are involved with the MRAP Program have land use plans to address the aforementioned land development and usage.

Several Federal Regulations and Acts define cultural resources. The National Historic Preservation Act identifies historic properties and the Native American Graves Protection and Repatriation Act of 1990 lists cultural items as cultural resources. The Archeological Resource Protection Act of 1979 defines archaeological resources as cultural resources. Facilities and installations must comply with the previously listed acts.

Air quality refers to the amount of air pollution within an area. Within the United States, the Clean Air Act (CAA) has historically regulated air pollution sources. The CAA's objectives are to protect and enhance the quality of the nation's air resources. The CAA also establishes a required ambient air quality level set by the National Ambient Air Quality Standards (NAAQS). The NAAQS consists of primary and secondary standards for six criteria air pollutants: sulfur dioxide, nitrogen dioxide, carbon monoxide, ozone, lead and particulate matter. Individual states have the authority to establish emission source requirements to achieve attainment of the NAAQS. The CAA also establishes the requirements and standards to control other air pollution problems. This includes standards for Hazardous Air Pollutants (HAPs), an acid rain reduction program, and a program to phase out the manufacture and use of Ozone Depleting Chemicals (ODCs). The facilities and military installations involved with the MRAP Program are required to comply with the CAA standards and requirements.

Similar to air quality, water quality refers to the amount of water pollution. For this PEA, water can include surface water (lakes, rivers, streams), groundwater (subsurface hydrologic areas such as aquifers), and storm water (water from impervious surfaces such as roads, buildings, etc). The activities associated with the MRAP program must comply with the Clean Water Act (CWA). The CWA regulates activities involving the collection and discharge of water borne pollutants and construction activities near waterways and wetlands.

Noise is generally defined as an unwanted sound. This could include a sound that occurs at a level that causes human hearing damage, is annoying in nature, or interferes with human communication. Military noise consists of noise from vehicle, equipment, and tool operation, high-amplitude noise from artillery and armor firing, and noise from

small arms firing. OEM and military installations have noise reduction and hearing protection programs to reduce the noise impacts on the environment and human health.

Solid wastes consist of wastes not classified as hazardous by the U.S. Environmental Protection Agency (EPA) or individual state regulatory agencies. Typical solid wastes include paper, cardboard containers and scrap metal. Military installations are required by 10 US Code (unless they are not economically sustainable) to participate in qualified recycling programs to reduce the volume of solid wastes sent to landfills for disposal.

Biological resources consist of vegetative species as well as animal species and their habitats. This includes desert, plains, wetland, and forest communities and their associated animal and plant species. Each installation and facility contains distinctive biological resources. The Endangered Species Act (ESA) was established to protect plant and animal species listed as threatened or endangered. Since the ESA is a federal law, installations where MRAP vehicles are fielded must comply with the ESA, and as a result, installations that have endangered and/or threatened species have installation wide programs.

Hazardous materials can be described as any item or agent (biological, chemical, physical) which has the potential to cause harm to humans, animals, or the environment, either by itself or through interaction with other factors. The Occupational Safety and Health Agency (OSHA) and the individual state regulatory agencies regulate hazardous materials. Hazardous wastes can be defined as solid, liquid, or semisolid waste or any combination of the previously listed that pose a substantial hazard to human health or the environment. The Resource Conservation and Recovery Act and state regulatory agencies identify what waste is considered hazardous, and regulates the generation, storage, treatment and disposal of such waste. MRAP Program activities must comply with federal, state and local hazardous material and waste regulations and laws.

Aesthetics and visual resources are usually defined as areas of unique beauty. Visual resources typically are found in natural landscapes or the human aspects of land use. A facility’s and installation’s aesthetics and visual resources are specific to each location.

Socioeconomics can be defined as the basic attributes and resources associated with the human environment, particularly population and economic activity. Environmental justice is a component of socioeconomics. Environmental justice means that no groups of people, including racial, ethnic and financial, should bear a disproportionate share of the negative environmental consequences. The socioeconomics of OEM facilities and military installations are primarily dependent upon the local area.

5.0 Environmental Consequences – Proposed Action

The following sections address the environmental consequences for the proposed action (the production, testing, training, fielding, and D&D of Army MRAP vehicles in the the JMVP). As mentioned previously, this PEA evaluates ERAs on a programmatic level and will look at the potential impacts common to all (or nearly all) Army locations where MRAP activities occur. Testing, training and fielding sites may have site specific conditions and resources which are unique to that site and thus, may require further NEPA analyses. Personnel at these Government sites are responsible for site specific NEPA documentation that addresses the actions at their installations. This includes MRAP vehicle operations and maneuver activities during testing, training, and fielding activities. The JPO MRAP will provide the installation personnel with the MRAP vehicle information they need to prepare and support the site-specific NEPA documentation that addresses MRAP vehicle testing, training and fielding activities.

5.1 Soil Resources

5.1.1 Production

The majority of MRAP vehicle production occurred in existing OEM buildings. For new buildings that were constructed to accommodate MRAP production processes, construction occurred on non-pristine land that had already been disrupted.

The OEM production facilities have concrete and/or impervious floors. These floors prevent fluid or fuel spills from contaminating underlying soils. Likewise, the outside MRAP vehicle storage areas have concrete slabs or hardened surfaces that present an impervious barrier. Contractor personnel follow facility spill prevention plans. This includes precautions to prevent overfilling of MRAP vehicle reservoirs. In addition, drip pans are placed under stationary MRAP vehicles to collect fluids dripping from loose drain plugs, differentials, etc. Regardless of the MRAP vehicles' location inside or outside an existing structure, personnel would respond to fluid or fuel spills in accordance with facility spill response plans.

The majority of production occurs in existing buildings; when new construction was needed, it occurred on non-pristine land. The draining of vehicles occurs over a hardened surface into appropriate containers. OEM personnel utilize drip pans to contain leaking fluids and use spill kits during fluid spills. As a result of these actions, MRAP vehicle manufacturing/integration had no noticeable or reported impact on soil resources.

5.1.2 Testing, Training and Fielding

Some testing, training and fielding activities required the removal of vehicle components that contain hydraulic fluid, engine coolant, fuel and oil. MRAP maintenance activities would follow Technical Manual (TM) protocol, which is designed

to eliminate spillage of vehicle fluids and fuel from these components onto surrounding soils. The removal of vehicle components and fluids occurs in maintenance areas that have a paved or hardened surface. This impermeable surface assists in containing the spills and preventing the fluids or fuel from migrating into surrounding soils. When conducting maintenance on MRAP vehicles, personnel follow installation spill response and prevention procedures to prevent or respond to vehicle fluid or fuel spills. By following these preventive procedures and responding to spills, the fielding activities' impact to the installations soil resources would be negligible.

The fielding activities of the MFT would occur in existing structures on paved or hardened surfaces. Storage of the vehicles prior to hand-off to the gaining units would also occur in areas that have hardened surfaces. As a result, soil erosion at the storage areas would be negligible during fielding activities.

Potential MRAP impacts on soil resources are attributable to the maneuver of MRAP vehicles on and off road during testing, training, and fielding activities. Soil erosion and compaction due to MRAP vehicle operation over unimproved surfaces will be addressed by site-specific NEPA documentation. Army installation personnel have the responsibility of conducting an evaluation and preparing that NEPA documentation. Appendix E contains a list of known MRAP variant ground pressures.

MRAP vehicles will be fielded to existing testing, training, and fielding sites which already house ground weapon systems including some or all of the following: Bradley Fighting Vehicles, Stryker Vehicles, Heavy Tactical Trucks, Medium Tactical Trucks, and Light Tactical Trucks. The impacts of the MRAP are anticipated to be similar to these existing vehicles which have not shown a significant impact to the environment when used in accordance with Technical Manual instructions and established installation procedures. Therefore, no direct, indirect or cumulative impacts to soil resources are anticipated or have yet been reported through Army MRAP life-cycle activities.

5.2 Land Use

5.2.1 Production

OEMs conduct the majority of MRAP vehicle production in pre-existing buildings. When OEMs needed to construct new buildings for MRAP production processes, the new buildings construction occurred in areas that already contain industrial buildings and utilities. As a result, Army MRAP production had no noticeable or reported impact on land use.

5.2.2 Testing, Training and Fielding

MRAP vehicle testing utilized existing test courses and ranges. These test areas have already been used during other vehicle test exercises. In addition, these areas are maintained to mitigate the negative impacts from vehicle activities. No new test ranges or courses have been built for MRAP tests. As a result, Army MRAP testing activities have had a negligible additional impact on land use.

MRAP training and deprocessing activities utilize existing structures and outdoor storage areas. Driver's training occurs on existing training areas and ranges. As a result, no building of new structures was required. Based upon the use of these existing structures, areas and ranges, Army MRAP training and fielding have negligible additional impact on land use.

MRAP vehicles will be fielded to sites with existing maintenance and storage areas that are already in use for other wheeled tactical vehicles or weapon systems. At a programmatic level, it is not anticipated that MRAP fielding will have a significant additional impact on land use resources. However, the MRAP CONUS fielding plan has not yet been finalized. When the information becomes available, Army fielding sites will be responsible to determine how MRAP fielding will impact their land use. A site-specific NEPA analysis and documentation may be required to address fielding activities that are expected to have a significant impact on land use, including the need for additional or expanded facilities and ranges. JPO MRAP will provide any required and requested system information to the installation personnel in support of document development.

MRAP vehicles will be fielded to existing testing, training, and fielding sites which already house ground weapon systems including some or all of the following: Bradley Fighting Vehicles, Stryker Vehicles, Heavy Tactical Trucks, Medium Tactical Trucks, and Light Tactical Trucks. The impacts of the MRAP are anticipated to be similar to these existing vehicles which have not shown a significant impact to the environment when used in accordance with Technical Manual instructions and established installation procedures. Therefore, no additional direct, indirect or cumulative impacts to land resources are anticipated or have yet been reported for Army MRAP life-cycle activities.

5.3 Cultural Resources

5.3.1 Production

The majority of MRAP vehicle production occurs in existing production facilities. Any new building construction occurred on previously disturbed land. No cultural resources have come in direct contact with the production processes and no known impacts have occurred to cultural resources.

5.3.2 Testing, Training, and Fielding

Typically, the use of the MRAP vehicles at testing installations is regulated and monitored through existing installation programs such as the Integrated Cultural Resources Management Plan (ICRMP) as required by Service unique requirements.

Training and fielding activities occur in existing buildings and staging areas. Driver's training occurs on existing training areas and ranges. No new buildings were built to support these activities. In addition, the installation personnel comply with the installations' ICRMP and other resource management programs.

If necessary, further evaluation of Army MRAP vehicle impacts related to vehicle operation during testing, training, and fielding activities on the installations' cultural resources will be addressed in site-specific NEPA documents. The site-specific NEPA documents are to be prepared by installation personnel. JPO MRAP will provide MRAP any required and requested system information to the installation personnel in support of document development.

Army MRAP vehicles will be fielded to existing testing, training, and fielding sites which already house ground weapon systems including some or all of the following: Bradley Fighting Vehicles, Stryker Vehicles, Heavy Tactical Trucks, Medium Tactical Trucks, and Light Tactical Trucks. The impacts of the MRAP are anticipated to be similar to these existing vehicles which have not shown a significant impact to the environment when used in accordance with Technical Manual instructions and established installation procedures. Therefore, no direct, indirect or cumulative impacts to cultural resources are anticipated or have yet been reported for Army MRAP life-cycle activities.

5.4 Air Quality

MRAP variants meet the EPA definition of a combat vehicle. Thus, Title 40 CFR 85.1703 and 89.908 exempts the MRAP vehicle engines from both on-highway and non-road diesel engine emission standards requirements. Although exempt, each of the engines is certified to a particular (non-current) EPA or European Union emission standard. Table 6 lists the engine types and emission standards the engines were certified to. Appendix F contains emission limits for the relevant standards.

Table 6. MRAP Variant Engine Types and Emission Standards

MRAP Variant	Engine	hp	Emission Standards
Cougar CAT I	Caterpillar C-7, 7.2L	330	EPA 2004 On-highway
Cougar CAT II	Caterpillar C-7, 7.2L	330	EPA 2004 On-highway
Buffalo	MACK AI-400 Diesel	400	EPA 2004 On-highway
RG31	Cummins QSB FR 91421	275	Euro 3 & US Tier 3 Non-road

RG33 CAT I	Cummins ISL, 8.9L	400	Euro 3
RG33 CAT II	Cummins ISL, 8.9L	400	Euro 3
HAGA CAT II	Cummins ISL, 8.9L	400	Euro 3
Caiman	Caterpillar C-7, 7.2L	330	EPA 2004 On-highway*
MaxxPro	International DT530 engine	300	EPA 1998 On-highway
M-ATV	Caterpillar C-7, 7.2L	330	EPA 2004 On-highway

*Only the first 1,192 vehicles have EPA 2004 certified engines. At that point the engine was recalibrated to meet performance requirements and is no longer EPA certified. However, the engine is exempt from EPA emission standards as discussed above.

5.4.1 Production

Prior to applying paint primers and topcoats to the MRAP vehicles, contractor personnel apply a chemical metal pretreatment or use abrasive blasting techniques on the MRAP vehicle hull. Table 7 contains a listing of pretreatments used on each MRAP variants' hull. The application of the pretreatments occurs in permitted paint booths using spray applications, and the abrasive blasting occurs in permitted blast booths.

During painting activities, contractor personnel apply interior/exterior paint primers and interior topcoats and exterior Chemical Agent Resistant Coating (CARC) topcoats using spray applications. Table 7 lists the types of primers and topcoats. These coatings contain various volatile solvents, and some of these solvents are listed as Volatile Organic Compounds (VOCs) and Hazardous Air Pollutants (HAPs). These primers and topcoats comply with current content regulations. Table 8 contains a listing of the primers' and coatings' VOC and HAP limits as defined by the specifications. The VOC and HAP content of these primers and topcoats remain at or below current US EPA requirements.

The spray application of wash primers, pretreatments, paint primers and topcoats takes place in permitted paint booths. These paint booths are included within the facilities' air emission discharge permits. The paint booths contain the necessary pollution abatement equipment to minimize air emissions as well as contain fugitive emissions.

Table 7. Primers and Topcoats Applied to MRAP Variants

Variant	Hull Pretreatment	Interior Primers	Interior Topcoat	Exterior Primer	Exterior CARC
Caiman	Abrasive Blast	MIL-P-53030 and MIL-P-53022	MIL-C-22750	A-A-59745	MIL-P-53039, Type I
MaxxPro	DoD-P-15328	MIL-P-53022	MIL-C-22750	MIL-P-53022	MIL-P-53039, Type I
RG33	AquaZen Wash Primer	MIL-P-53030	MIL-C-22750	MIL-P-53030	MIL-P-53039, Type I
Cougar/Buffalo	Bonderite 7400	MIL-P-53022	MIL-C-22750	MIL-P-53022	MIL-P-53039, Type I

Variant	Hull Pretreatment	Interior Primers	Interior Topcoat	Exterior Primer	Exterior CARC
RG31	DoD-P-15328	MIL-P-53030	MIL-C-22750	MIL-P-53022	MIL-P-53039, Type I
M-ATV	DoD-P-15328	MIL-P-53022	MIL-C-22750	MIL-P-53022	MIL-P-53039, Type II

Table 8. Maximum Volatile Organic HAP and VOC Contents of Primers and Topcoats

Paint Primers	Maximum VOC Content	Maximum VOHAP Content
MIL-P-53030	300 grams/liter (2.3 pounds/gallon)	0 grams/liter (0 pounds/gallon)
MIL-P-53022B	340 grams/liter (2.8 pounds/gallon)	0 grams/liter (0 pounds/gallon)
Topcoats	**Maximum VOC Content**	**Maximum HAP Content**
MIL-DTL-53039, Type I	420 grams/liter (3.5 pounds/gallon)	0 grams/liter (0 pounds/gallon)
MIL-DTL-53039, Type II	180 grams/liter (1.5 pounds/gallon)	0 grams/liter (0 pounds/gallon)
MIL-DTL-64159, Type II	220 grams/liter (1.8 pounds/gallon)	0 grams/liter (0 pounds/gallon)
MIL-C-22750	420 grams/liter (3.5 pounds/gallon)	0 grams/liter (0 pounds/gallon)

Appendix B contains a listing of materials used during MRAP production. These listings contain solvents, metal parts cleaners, anti-seize compounds, lubricants, and adhesives that contain VOCs and HAPs. Contractor personnel use these or similar compounds and materials during the non-MRAP production in their facilities. It is responsibility of the contractor to ensure that the use of these products was in compliance with environmental and safety laws and regulations during the production process.

The MRAP vehicles contain fire suppression systems. These systems contain fire-extinguishing agents. Appendix C contains a listing of these agents. The loading of the fire-extinguishing agents into the fire suppression system bottles occurs in a controlled situation using equipment designed to minimize any leakage of the agent into the environment. No ozone depleting chemicals are used in MRAP fire suppression systems.

The MRAP vehicle air conditioning units/Environmental Control Units (ECUs) contain R-134a as the refrigerant. R-134a has a Global Warming Potential (GWP) of 1300. Personnel use specialized equipment to load the R-134a into the air conditioners/ECU condensers. The use of this equipment minimizes the possibility of any discharge of R-134a to the air. Once filled with the R-134a, the air conditioning units/ECUs retain the refrigerant during vehicle operation.

At the various OEM facilities, the combined number of MRAP vehicles and non-MRAP vehicles that underwent production remained consistent with the facilities' typical

monthly levels of vehicle integration and manufacturing prior to the start of MRAP production. Those same MRAP production activities, including the use of similar or identical compounds, continued at these facilities following completion of MRAP production. As a result, air emissions associated with the MRAP integration and manufacturing did not cause the OEM facilities to exceed air emission permits, and production of the MRAP vehicles had a minimal impact on the facilities' surrounding air quality.

5.4.2 Testing

Testing sites located in non-attainment and maintenance areas are regulated by the General Conformity Rule. Installation personnel performed an air conformity analysis, as required by the rule, to ensure that the additional vehicles and activities associated with those vehicles will not impact conformance to the air quality initiatives established in the applicable state implementation plan.

Testing required the operation of MRAP vehicles on cross-country trails. These trails include unhardened surfaces that contain soil that could become airborne due to MRAP vehicle movement. Only a limited number of vehicles were procured for testing (Table 2) and only 29-49 vehicles were used for any one particular test phase (Section 4.3). The operation of the MRAP vehicles for testing occurred on a periodic basis and for a limited duration and described in Section 4.3. Additionally, the operators of the vehicles complied with installation requirements and procedures to minimize the generation of airborne particulate matter. Personnel at each installation evaluate any impact cross-country driving will have on the installation's air quality

Testing of MRAP variants required periodic scheduled maintenance as well as repair activities at the test installations. MRAP vehicles' maintenance and repair includes the use of cleaning solvents and adhesives. A listing of compounds used during MRAP variant maintenance is found in Appendix B. These compounds contain hazardous materials, such as HAPs and VOCs. Based upon consumable and expendable materials lists in other U.S. ground vehicle systems' TMs, the required types and amounts of materials for MRAP vehicle maintenance (including criteria pollutants, VOCs, and HAPs) are similar to those used during maintenance activities on other existing ground vehicle systems. This includes the Stryker FoVs, M2/M3 Bradley Fighting Vehicle System, M1097 HMMWV, and M1083 5-ton truck TMs. MRAP vehicle maintenance does not require the use of any unique or new materials or procedures.

Vehicle painting activities were not part of vehicle maintenance during test activities.

The MRAPs' air conditioning units contain R-134a as the refrigerant. The MRAP variants' TMs specify the evacuation and recovery of the refrigerant prior to ECU/air conditioner system refrigerant maintenance. The TMs also require reuse of the recovered R-134a.

This recovery and reuse of the refrigerant limits the need to purchase additional R-134a refrigerant and potential to release the refrigerant into the environment.

The MRAP variants contain fixed fire suppression systems. These systems contain fire-suppression agents. Appendix C contains a list of these agents. Maintenance activities during test activities did not require the evacuation of the fire suppression system agent bottles. As a result, the opportunity for release of the fire-extinguishing agents was negligible. The MRAP FoV does not contain nor use Class I ODCs.

The automotive lead-based batteries used in the MRAP vehicles could be exposed to extreme conditions such as high heat or flame and could consequently expel hazardous/toxic fumes. In the unlikely event of damage or explosion of batteries, the amount of fumes released would be minor and would not present a threat to air quality.

When compared to other ground vehicle maintenance activities at the test locations, any change to the amount of HAPs or VOCs emitted to the air during MRAP maintenance in conjunction with test activities were minimal. In addition, only a limited number of MRAP vehicles were procured to undergo testing (Table 2), which also limited the amount of HAPs and VOCs emissions during repair and maintenance activities. Thus, the impact to the test installations' air quality due to MRAP maintenance and operations during testing was minimal.

5.4.3 Training and Fielding

Fielding/Training sites located in non-attainment and maintenance areas are regulated by the General Conformity Rule. Installation personnel were required to perform an air conformity analysis to ensure that the additional vehicles and activities associated with those vehicles did not impact conformance to the air quality initiatives established in the applicable state implementation plan.

Dust generation at training and fielding locations depends on the type of soil present, the extent and type of vegetation cover, precipitation and vehicle speed. The operation of the MRAP vehicles, however, occurs on a periodic basis and for a limited duration. Additionally, the operators of the vehicles comply with installation requirements to minimize the generation of air borne particulate matter. Since MRAP training and fielding sites are located on military facilities, are generally remote from population centers, and operations occur on established ranges with a limited number of vehicles (1,800 vehicles total spread out over training locations defined in Tables 4 and 5), there should be only a small potential for public exposure to any excessive amounts of dust that may be generated. However, each training and fielding facility is required to comply with the environmental impact analyses requirements of NEPA. Thus, personnel at Army installations are responsible to evaluate how dust generation will impact their installation's air quality. A site-specific NEPA analysis and documentation may be required to address MRAP activities that are determined to have a significant impact on

air quality. This could include excessive dust generation from cross country driving or encroachment by surrounding population areas where public exposure would be an increased risk.

The automotive lead-based batteries used in the MRAP vehicles could be exposed to extreme conditions such as high heat or flame and could consequently expel hazardous/toxic fumes. In the unlikely event of damage or explosion of batteries, the amount of fumes released would be minor and would not present a threat to air quality. The MRAP FoV does not contain nor use Class I ODCs.

MRAP training programs include vehicle maintenance activities. The maintenance activities do not occur continuously, but rather, the training occurs on a periodic basis. Additionally, the training activities focus primarily on removing and replacing components on the vehicles, and these vehicles' maintenance activities require limited use of solvents and adhesives. The solvents and adhesives contain hazardous materials, such as HAPs and VOCs. A listing of the solvents and compounds can be found in the hazardous materials lists in Appendix B. When compared to other military vehicles' maintenance procedures, MRAP vehicle maintenance does not require the use of any unique or new materials or procedures.

Vehicle painting activities are not planned as part of the vehicle maintenance during training activities. Likewise, vehicle maintenance training does not require the evacuation of the R-134a from the ECUs or the release of the fire extinguishing agents.

The majority of MRAP training does not involve use of solvents, cleaners, adhesives or other VOC and HAP containing compounds. Any maintenance training that does require use of those materials is limited in application amounts and exposure time to the air. MRAP vehicle emissions are comparable to heavy-duty trucks. As a result, any impacts to air quality due to MRAP training are expected to be minimal.

MRAP fielding consists of final preparation of the vehicles prior to shipment as well as support and maintenance activities after the units receive the vehicles. Deprocessing consists of the final preparation of the MRAP vehicles prior to the military units receiving the vehicles. The preparation would involve the necessary vehicle maintenance and completion of final vehicle integration activities. Efforts typically consist of filling vehicle fluid reservoirs, attaching vehicle components and ensuring the vehicle's integrated systems operate according to specifications.

If required during vehicle deprocessing, the vehicle painting involves only touch-up painting. Areas that require touch up painting are often less than a square foot per vehicle. Touch up painting would only require the use of the CARC topcoat. The topcoat and solvent containers are covered except during painting activities. This practice limits the amount of VOC and HAP emissions from the containers. If needed, complete repainting of the vehicle will occur during Sustainment Level Maintenance and take place in permitted paint booths.

MRAP maintenance activities will require the use of solvents, cleaners, and adhesives. MRAP vehicle deprocessing activities occasionally require these materials as well. These compounds contain air pollutants, such as HAPs and VOCs. Appendix B contains a list of the hazardous materials that may be used during MRAP fielding activities. MRAP vehicle fielding will not require the use of any unique materials when compared to other military ground vehicle systems. The amount of these compounds used during an application is typically small, and procedures require the immediate resealing of containers after compound application. As a result, the amount of air emissions related to compound use is limited in volume.

Use of compounds containing air pollutants occurs in limited quantities and time periods. Any container that has these compounds remains sealed when not in use. During deprocessing and field level maintenance, painting activities are limited to small areas on the MRAP vehicles. Complete repainting of the vehicles will be completed in approved paint booths. As a result, Army MRAP fielding activities have a minimal impact to the surrounding areas' air quality.

Army MRAP vehicles will be fielded to existing testing, training, and fielding sites which already house ground weapon systems including some or all of the following: Bradley Fighting Vehicles, Stryker Vehicles, Heavy Tactical Trucks, Medium Tactical Trucks, and Light Tactical Trucks. The impacts from the MRAP to air quality are anticipated to be similar to these existing vehicles which have not shown a significant impact to the environment when used in accordance with Technical Manual instructions and established installation procedures. Therefore, no direct, indirect or cumulative impacts to air quality are anticipated or have been reported for Army MRAP life-cycle activities.

5.5 Water Quality

5.5.1 Production

The wastewater treatment is dictated by the facility where the MRAP production occurs. MRAP vehicles were manufactured by existing OEM's, therefore the OEM's had existing treatment procedures in place prior to beginning MRAP production. Wastewater either undergoes treatment at a facility's Industrial Wastewater Treatment (IWT) facility prior to discharge into the environment; undergoes pretreatment at the facility's IWT facility prior to discharge to a Publicly Owned Wastewater Treatment (POWT) facility for additional treatment before discharge into the environment, or the industrial wastewater is directly sent to a POWT facility for treatment. Regardless of the location of the treatment, the wastewater generated from MRAP manufacturing/integration was required to be treated and meet the conditions set forth in the treatment facility's National Pollutant Discharge Elimination System (NPDES) permit before it was discharged into the environment.

MRAP production activities occurred inside enclosed buildings. These buildings have floor drains and sewer systems that connect to the facility sewer system. Personnel involved in the MRAP manufacture and integration followed instructions on the proper method for filling vehicle fluids. The storage and disposal of any drained fluids followed the facilities' requirements and procedures. Responses to any vehicle fluid or fuel spill occurred in accordance with the facilities' spill response plans. By following facility instructions, plans and requirements as well as utilizing the appropriate equipment, the migration of vehicle fluids to local bodies of water was minimized if not eliminated.

The outside storage of MRAP vehicles took place in low numbers at one time and for a limited duration prior to shipment. The MRAP vehicles had a recently applied exterior CARC topcoat over metal post treatments, and as a result, these coatings prevented heavy metal contamination of storm water from the MRAP vehicles' metal post treatments.

5.5.2 Testing

MRAP maintenance activities occurred during test activities to repair various vehicle components. These repair activities sometimes required the removal of hydraulic fluid, engine coolant, and petroleum, oil and lubricants (POL). Appendix D contains a listing of vehicle fluids. The removal of the vehicle fluids occurred in the test installations' maintenance bays. MRAP vehicle maintenance activities followed TM protocol and the installations' spill prevention control and countermeasures plan (SPCCP). The SPCCP provides guidance on the elimination or control of vehicle fluid and fuel spills. This includes the use of drip pans, containers and temporary berms to retain loose vehicle fluids. The use of these pans, berms and containers minimize if not eliminate the migration of vehicle fluids into the installation sanitary sewer lines and surrounding bodies of water. When conducting maintenance on the MRAP vehicles, personnel also follow Installation Spill Contingency Plans (ISCPs) to respond to vehicle fluid or fuel spills.

By following the technical manual procedures and other installation requirements, and utilizing the appropriate equipment, the migration of vehicle fluids to local bodies of water was minimized if not eliminated.

5.5.3 Training and Fielding

Training activities require component level repair, which involves the removal of hydraulic fluid, engine coolant, fuel and oil. Likewise, deprocessing activities sometimes require component removal and repair. Personnel involved with the removal and repair of components, which contain vehicle fluids, follow TM instructions. These instructions are written to minimize, if not eliminate, the migration of vehicle fluids into the installation sanitary sewer lines and surrounding bodies of water. The removal of component fluids from the vehicles occurs in areas with hardened floor surfaces. When conducting repair activities, personnel also follow procedures specified in MRAP TMs as well as installation

specific SPCCP and ISCPs. These procedures also contain instructions on how to minimize any release of vehicle fluids to the environment, and required procedures to contain and remove spilled vehicle fluids.

By following SPCCPs and TMs, personnel minimize the potential of vehicle fluid spills during deprocessing activities. In response to a spill of vehicle fluids, the MFTs use ISCPs and appropriate spill response equipment to minimize, if not eliminate, the migration of vehicle fluids to local bodies of water. As a result, Army MRAP vehicle training and fielding activities are expected to have a negligible impact on the environment. However, each training and fielding facility is required to comply with the environmental impact analyses requirements of NEPA. Thus, personnel at Army installations are responsible to determine how MRAP fielding activities will impact their installation's water quality, if different than described above. A site-specific NEPA analysis and documentation may be required to address MRAP activities that are determined to have a significant impact on water quality. This may include excessive stream or surface water sedimentation during off-road operations. JPO MRAP will provide any required and requested system information to the installation personnel in support of document development.

Army MRAP vehicles will be fielded to existing testing, training, and fielding sites which already house ground weapon systems including some or all of the following: Bradley Fighting Vehicles, Stryker Vehicles, Heavy Tactical Trucks, Medium Tactical Trucks, and Light Tactical Trucks. The impacts from the MRAP to water quality are anticipated to be similar to these existing vehicles which have not shown a significant impact to the environment when used in accordance with Technical Manual instructions and established installation procedures. Therefore, no direct, indirect or cumulative impacts to water quality are anticipated or have been reported for Army MRAP life-cycle activities.

5.6 Noise

5.6.1 Production

Within the OEM facilities, some production activities such as drilling and grinding generated noise levels that exceed 85 Decibels, A-weighted (dBA). However, exterior facility noise levels associated with vehicle manufacturing/integration remained below 85 dBA. As a result, the MRAP vehicle production had a negligible impact upon the facilities surrounding area due to noise generation.

5.6.2 Testing, Training and Fielding

Noise generated by MRAP vehicle engines may have the potential to adversely affect nearby wildlife and may potentially cause human health risks. The Noise Control Act of

1972 established that Federal agencies should comply with Federal, State, interstate, and local requirements requiring control and abatement of environmental noise to the same extent as private entities.

The vehicles are required to meet the requirements of the CFR Title 49 Transportation Part 325, Compliance with Interstate Motor Carrier Noise Emission Standards. Appendix G contains a listing of exterior noise levels collected during testing of MRAP vehicles. The MRAP's noise levels are comparable to the noise levels of the other military vehicle systems.

Per AR 200-1, the Army's Environmental Noise Management Program (ENMP) incorporates and replaces the Installation Compatible Use Zone Program (ICUZ). The goals of the Army's ENMP are to: (1) control environmental noise to protect the health and welfare of people, on- and off- post/Civil Works Facilities (CWF), impacted by all Army-produced noise, including on- and off-post/CWF noise sources; and (2) reduce community annoyance from environmental noise to the extent feasible, consistent with Army training and materiel testing activities.

Army MRAP vehicles will be fielded to existing testing, training, and fielding sites which already house ground weapon systems including some or all of the following: Bradley Fighting Vehicles, Stryker Vehicles, Heavy Tactical Trucks, Medium Tactical Trucks, and Light Tactical Trucks. The noise related impacts from the MRAP are anticipated to be similar to these existing vehicles which have not shown a significant impact to the environment or the surrounding areas. The testing, training and fielding activities likely occur, or have occurred, in already developed areas and away from residential neighborhood. This reduces community annoyance and protects the welfare of the community. As a result, MRAP vehicles are expected to have a negligible impact on the surrounding areas' noise levels. Therefore, no direct, indirect or cumulative impacts to noise levels are anticipated or have been reported for Army MRAP life-cycle activities.

Each training, testing and fielding facility is required to comply with the environmental impact analyses requirements of NEPA. Thus, personnel at Army installations are responsible to determine how MRAP fielding activities will impact their installation's noise levels, if different than described above. A site-specific NEPA analysis and documentation may be required to address MRAP activities that are determined to significantly increase noise generation or complaints. This could include encroachment by surrounding population areas where public aggravation would be an increased risk. JPO MRAP will provide any required and requested system information to the installation personnel in support of document development.

5.7 Solid Waste

5.7.1 Production

MRAP production activities generated non-hazardous solid wastes. The non-hazardous wastes included cardboard boxes and containers, empty metal drums, plastic containers, scrap metal packaging material and pallets. Some contractors recycled wastes – such as paper, metal, and wood – when a local market exists. These recyclable materials were transported to an off-site recycling company. The contractors sent non-recyclable material to a landfill for disposal. The handling, storage, recycling and disposal of the waste occurs in accordance with federal, state and local non-hazardous waste regulations and laws.

5.7.2 Testing, Training, and Fielding

Like the production activities, non-hazardous wastes generated during testing, training and fielding include empty cardboard and metal containers as well as packaging and shipping materials.

The non-hazardous waste volumes generated by MRAP vehicle maintenance are not anticipated to exceed current volumes generated during other ground vehicle maintenance activities. This analysis is based upon waste streams generated for the Stryker FoVs, M2/M3 Bradley Fighting Vehicle System, M1097 HMMWV and M1083 5-ton truck.

The vehicle maintainers during testing and training as well as the MFTs also participate in the installations' recycling programs. Recycled materials include some vehicle fluids – such as oil and engine coolant. Non-recyclable materials are disposed in accordance with the installations local, state, and federal laws and regulations.

With minimal waste generation, active recycling programs, and the limited amount of non-hazardous waste that is land-filled, MRAP testing, training and fielding activities are expected to have a minimal impact on the environment as a result of solid waste production.

Each training, testing and fielding facility is required to comply with the environmental impact analyses requirements of NEPA. Thus, personnel at each installation are responsible to determine how MRAP fielding activities will impact their installation's solid waste levels, if different than described above. A site-specific NEPA analysis and documentation may be required to address Army MRAP activities that are determined to significantly increase solid waste generation. This could include increasing fleet size until the demand on solid waste or recycling infrastructure is to the point that expansion or improvements are required. JPO MRAP will provide any required and requested system information to the installation personnel in support of document development.

5.8 Biological Resources

5.8.1 Production

The majority of MRAP vehicle production occurs in existing production facilities. Any new building construction occurred on previously disturbed land. No biological resources were known to be in direct contact with the production processes, and no known impact has occurred to biological resources.

5.8.2 Testing, Training, and Fielding

The use of the MRAP vehicles at testing installations was regulated and monitored through existing installation programs including the Natural Resources Management Plan (NRMP) as required by Service unique requirements.

Training and fielding activities occur in existing buildings and staging areas. No new buildings were built to support these activities. In addition, the installation personnel complied with the installations' NRMP, Integrated Training Area Management Programs, and other resource management programs. However, minor impacts to biological resources (disturbances to vegetation/habitat and wildlife) may occur during the maneuver of MRAP vehicles on and off road during testing, training, and fielding activities. These effects can be mitigated through strict adherence to local installation regulations.

It is anticipated that the testing, training and fielding of Army MRAP vehicles will not have a significant impact on biological resources due to programs already in place at the installations and the fact that these activities will be periodic and of short duration. If deemed necessary by installation personnel, further evaluation of the MRAP vehicles' impacts related to vehicle operation during testing, training and fielding activities on the installations' biological resources will be addressed in site-specific NEPA documents. The site-specific NEPA documents are to be prepared by installation personnel. JPO MRAP will provide any requested information in support of this documentation development.

5.9 Hazardous Materials and Hazardous Waste

The JPO's overall risk reduction strategy was to reduce the use of hazardous materials and integrate Pollution Prevention (P2) into the program, wherever feasible. The JPO addressed P2 concerns by emphasizing source reduction of waste generating materials, minimizing adverse impacts on the environment and emphasizing the reuse, recycling and disposal of waste in an environmentally acceptable manner. In accordance with DoDI 5000.02, the JPO will document hazardous materials used in the system and plan for their demilitarization and safe disposal.

The JPO is also working with the Joint Services Weapons Safety Review (JSWSR) to assess the use of weapons, explosive materials, and munitions. The JMVP is the first DoD program to utilize the JSWSR process to obtain an independent technical safety evaluation by members of all of the Services' weapons and explosives safety boards.

5.9.1 Production

Hazardous materials can be described as any item or agent (biological, chemical, physical) which has the potential to cause harm to humans, animals, or the environment, either by itself or through interaction with other factors. The MRAP vehicle contract contains language that required hazardous material management. Contractors were required to ensure that design, maintenance, operation, manufacturing and programmatic decisions strive to eliminate or reduce hazardous material usage and waste production.

Various Contractors submitted their lists of hazardous materials. Appendix B contains a listing of hazardous materials used to manufacture and integrate the MRAP vehicles. These materials were used by contractor personnel at the various locations. Appendix D contains a list of vehicle fluids in each MRAP variant. Based upon the lists of materials provided in Appendix B, the MRAP production process did not require the use of unique compounds or materials.

OEM personnel handled, stored and applied/used these hazardous materials following OEM production procedures. These procedures contain precautions that limited the exposure of the hazardous materials to the environment. OEM personnel also have spill prevention and spill response plans in place that minimized any potential contamination of the surrounding environment. When personnel complied with applicable procedures for use, handling and storage of hazardous materials, the impact of using them was minimal.

Hazardous wastes can be defined as solid, liquid, or semisolid waste or any combination of the previously listed that pose a substantial hazard to human health or the environment. The Resource Conservation and Recovery Act and state regulatory agencies identify what waste is considered hazardous, and regulates the generation, storage, treatment and disposal of such waste. MRAP Program activities must comply with federal, state and local hazardous material and waste regulations and laws.

MRAP vehicles contain heavy and toxic metals such as Hexavalent Chromium (Cr(VI)), Cadmium (Cd) and Lead, (Pb). Cr(VI) is often used on metal surfaces as a pre- or post-treatment. The application of Cr(VI) results in the generation of spent liquid Cr(VI) waste stream. The personnel at OEM and supplier facilities contained and stored the hazardous waste streams in appropriate containers until wastes can be shipped to an off-site waste treatment and disposal facility for disposal. The collection, storage and transportation of the spent Cr(VI) waste stream occured in accordance with applicable

laws and regulations. Cd is used as plating for electrical connectors and several other components within the MRAP vehicle. The Cd plating process involves a batch application, which also generates a Cd waste stream. Like the spent Cr(VI) waste stream, the Cd waste was stored in appropriate containers and disposal occured at an off-site waste treatment and disposal facility. Pb is used on the MRAP vehicles in electrical systems as a solder. The use of Pb resulted in a small Pb waste stream composed of unusable solder paste. This waste stream was stored in hazardous waste containers until it is disposed at a permitted landfill.

Vehicle production painting operations generated waste paint, fiberglass paint filters, and used paint thinner. Any paint waste streams were treated as hazardous wastes in accordance with federal, state and local laws and regulations. The types of paint related wastes remained similar to those generated during past vehicle painting operations at OEM facilities. Other hazardous wastes resulting from vehicle production included spent cleaning solvents and metal treatments, machinery oil, and excess adhesives and sealants. The OEMs are responsible for proper handling, storage and disposal of hazardous wastes in accordance with facility instructions and permits as well as federal, state, and local laws and regulations.

5.9.2 Testing

Testing of MRAP variants required periodic scheduled maintenance as well as repair activities. Appendix B contains a listing of hazardous materials required for MRAP vehicle maintenance. Based upon other U.S. vehicle system TMs, the amount and type of hazardous materials used during MRAP vehicle maintenance remains consistent with the current type and volume of hazardous materials used on other ground vehicle systems. These systems include the Stryker FoVs, M2/M3 Bradley Fighting Vehicle System, M1097 HMMWV, and M1083 5-ton truck TMs. MRAP vehicle maintenance and repair does not require any unique activities or materials when compared to other currently fielded ground vehicles. As a result, the quantity and type of hazardous materials used for MRAP vehicle maintenance remained consistent with the volumes and types of materials used at the test installations for other programs.

The use of these hazardous materials results in the generation of hazardous wastes. The majority of hazardous materials used in the maintenance activity remain on the vehicles, and as a result, the volume of hazardous wastes generated for disposal will be lower than the volume of hazardous materials used. Vehicle painting activities were not part of the vehicle maintenance during test activities.

Appendix D contains a description of vehicle fluids found on MRAP variants. These materials are also similar to those materials used on currently fielded Army ground vehicles. The removal of Ethylene Glycol and other vehicle fluids from the vehicles results in the generation of a hazardous waste. When possible, these used vehicle fluids as well as cleaning solvents are recycled for re-use. If not recycled, the vehicle fluids

and solvents are disposed of in accordance with federal, state, and local laws and regulations.

The test installations' personnel have developed and follow appropriate hazardous material and waste handling guidelines, management procedures and disposal activities in order to comply with applicable federal, state, and local environmental laws and regulations. Any response to hazardous material or waste spills will be in accordance with the installations' SPCCP and ISCP. In addition, the amount of hazardous materials used during testing was limited. As a result, use of hazardous materials and waste generation had a minimal impact on the environment.

5.9.3 Training

The majority of training activities, such as component removal and replacement, do not require the use of hazardous materials. Hazardous materials usage primarily occurs when vehicle fluids are removed or placed into the MRAP vehicles. Some maintenance activities, however, require the use of solvents and adhesives, which contain hazardous materials. These activities will be periodically taught during training activities. Appendix B contains a list of hazardous materials used during manufacture, integration, and maintenance activities. The solvents and adhesives listed are similar to those materials used on currently fielded military ground vehicles. These vehicles include the Stryker FoVs, M2/M3 Bradley Fighting Vehicle System, M1097 HMMWV, and M1083 5-ton truck. When compared to those same vehicles maintenance procedures, the MRAP vehicle maintenance and repair training activities do not require any unique activities or new materials. As a result, the quantity and type of hazardous materials used for MRAP vehicle maintenance training would remain consistent with the volumes and types of materials used for other military ground vehicles.

The use of hazardous materials during Army MRAP vehicle training exercises results in the generation of hazardous wastes. The removal of ethylene glycol and oils from the MRAP vehicles results in the generation of a hazardous waste. When possible, used vehicle fluids and cleaning solvents are recycled for re-use. The handling, storing, and disposal of these hazardous wastes follow installation specific procedures. These procedures comply with applicable federal, state, and local environmental laws and regulations. Training personnel and students respond to hazardous material or waste spills in accordance with the sites' SPCCP and ISCP.

The amount of hazardous materials used during MRAP vehicle maintenance training remains consistent with other DoD ground vehicle maintenance activities and hazardous materials usage rates. The volume and type of hazardous waste generated is minimal, and when possible, the waste vehicle fluids and solvents are recycled. As a result, the use of hazardous materials and generation of hazardous wastes due to Army MRAP training activities is minimal.

5.9.4 Fielding

As the MRAP vehicles are deployed, MFTs have responsibility for preparing the MRAP vehicles prior to release to the gaining unit. This preparation is referred to as deprocessing, and consists of the final integration of components and performing final maintenance activities on the vehicles such as filling vehicle fluids and touch up painting. The deprocessing activities require the use of hazardous materials. Appendix B contains the list of hazardous materials that may be used. The MFTs would not require the use of any unique hazardous materials when compared to other MRAP lifecycle phases. Once vehicles are fielded routine maintenance is performed at regular intervals to sustain the vehicles.

The handling of hazardous materials by the MFTs follows established procedures, and likewise, hazardous waste generated by the MFTs are handled and stored according to installation requirements. Hazardous wastes generated by the MFTs are transferred for disposal or recycling in accordance with federal, state and local laws and regulations.

Maintenance activities are usually conducted in a maintenance bay or garage where facilities exist for proper handling and storage of Petroleum, Oils, and Lubricants (POLs). Waste POLs are usually considered non-hazardous and are either recycled, if such facilities exist at an installation, or disposed of as a non-regulated waste through the installation hazardous waste management facility.

During Operator/Crew level maintenance when unit personnel use CARC for touch ups and spot painting, they are required to use only small quantities. Spent thinners and stripping solvents may be deemed hazardous waste and must be disposed of in accordance with applicable environmental laws and regulations. Full re-painting of vehicles would be completed during Sustainment level maintenance and would be performed in a permitted paint booth. Painting operations generate waste paint, fiberglass paint filters, and used paint thinner. Any paint waste stream will be treated as hazardous wastes in accordance with federal, state and local laws and regulations. Cured primers and topcoats remain benign to the environment; however, coating stripping processes such as grinding, scraping or solvent removal for component attachment generates a hazardous waste stream. This waste stream may contain leachable chromium and toxic metals, in addition to any solvents used. If primer and topcoat removal is required, MFT personnel collect the removed coating materials and store it in appropriate containers.

Batteries used in the MRAP variants are 12-volt lead acid type. Maintenance personnel are provided with training on replacement and proper disposal of lead acid batteries. These batteries are usually recycled through installation recycling programs.

Silica, copper, zinc and graphite, which are hazardous materials, remain encapsulated within cured anti-seize compounds. When encapsulated, there are no free respirable silica, copper, zinc or graphite particles present. Maintenance procedures that produce silica, copper, zinc and graphite bearing-dust (i.e. sanding, grinding, etc.), will release respirable particles. These particles are considered hazardous. Air-borne dust from the anti-seize should also be considered an explosion risk. Any maintenance activity involving anti-seize removal occurs in areas with proper ventilation controls with personnel wearing the required personnel protection equipment.

Fielding and Maintenance activities require limited amounts of hazardous materials, and these activities also generate limited volumes of hazardous wastes. MFT and Maintenance personnel follow installation procedures and regulation while using handling, storing, and disposing hazardous materials and wastes. As a result, impacts to the environment from fielding activities are expected to be minimal.

Each training, testing and fielding facility is required to comply with the environmental impact analyses requirements of NEPA. Thus, personnel at each installation are responsible to determine how MRAP fielding activities will impact their installation's hazardous waste levels, if different than described above. A site-specific NEPA analysis and documentation may be required to address Army MRAP activities that are determined to significantly increase hazardous waste generation or transportation. This could include increasing demand on hazardous waste storage or transportation infrastructure to the point that expansion or improvements are required. JPO MRAP will provide any requested information in support of this documentation development**.**

5.9.5 Overseas Hazardous Waste Management

OCONUS shipment of hazardous waste generated on DoD's overseas installations and facilities is restricted per DODI 4715.5, Management of Environmental Compliance at Overseas Installations, the Overseas Environmental Baseline Guidance Document (OEBGD) and the Final Governing Standards (FGSs) for each country. If environmentally sound disposal within the host nation is not possible, the waste may be returned to the U.S., or, with approval of DoD, transported by the component to another country for disposal. At international sites, FGSs for each Host Nation (HN) dictate handling and disposal requirements for DoD materials. The Defense Reutilization and Marketing Service (DRMS) and DRMS International (DRMSI) manage the local disposal facilities utilized by installations for disposal of materials. Only vendors approved by DRMSI (also referred to as DRMS Europe) are used for disposal or recycling.

D&D activities require action specific analyses to evaluate the potential for environmental impacts on a site-specific basis. Coordination with the Defense Logistics Agency (DLA) would determine reutilization and hazardous property disposal requirements for system equipment and by-products.

5.10 Aesthetic and Visual Resources

The production of the MRAP vehicles primarily occurs in existing buildings. New building construction occurred on previously disturbed ground and near existing buildings. Although significant impacts are not anticipated, Army MRAP vehicles' operation and storage impacts to testing, training and fielding installations' aesthetic and visual resources will be addressed in site-specific NEPA documentation. The site-specific NEPA documents are to be prepared by the installation personnel. JPO MRAP will provide any required and requested MRAP vehicle system information to the installation personnel.

5.11 Socioeconomics

The manufacturing/integration of the MRAP allowed the contractors to maintain, if not slightly increase, their workforce. In addition, the manufacturing/integration of the vehicles has also provided a market for vendors to the contractors. Following the completion of the contract, contractors returned to production levels similar to those prior to the MRAP program. Contractors will have the option to bid on future government contracts. As a result of MRAP production, a slight improvement in socioeconomics is anticipated in areas where MRAP vehicle manufacturers and vendors are located. This may be followed by a slight negative impact to socioeconomics when MRAP production concludes. Therefore, the overall impact to socioeconomics will be minimal.

No significant socioeconomic impact is anticipated, as the proposed action should not introduce significant new activity (or levels of activity) in the affected areas. There are no Executive Order 12898 “Environmental Justice” concerns at the MRAP programmatic analysis level since it is not anticipated that the proposed action would result in any disproportional high and adverse human health and environmental effects on children, minority and/or low income populations. Fielding installations will address any Environmental Justice concerns during their site-specific NEPA analysis.

5.12 Health and Safety

For the JMVP, each Service has a designated Service Principal for Safety (PFS). The Service PFS is responsible for coordinating service-specific and service-unique safety matters. The MRAP Program is using the system safety process described in MIL-STD-882D, DoD Standard Practice for System Safety, as part of the systems engineering process to identify ESOH hazards and manage ESOH risks. The system safety methodology in MIL-STD-882D provides a structured approach to determine risk levels associated with specific hazards based on the probability of occurrence of a hazard and the severity of the consequences if the hazard does occur. The primary method for identification of hazards is via observation and results obtained from the DT, LUE and

Follow-on Testing. The MRAP program also has a Joint System Safety Working Group (SSWG) that identifies, tracks and mitigates health and safety risk identified on the program. A hazard tracking system is used by the Joint SSWG to document identified hazards.

The MRAP vehicle's non-combat life cycle activities (i.e. production, testing, training and D&D) have inherent health and safety risks. These risks come from use of various equipment and processes. They result from use of cutting and drilling machinery, paint application, heavy lift equipment and operation of the vehicles. The contractors and Government have implemented various safety and health protection programs to protect their personnel from health and safety risks. This includes maximum lift restrictions, use of personnel protection equipment and required training classes. The general (non-military) population will have very little contact with the MRAP. Possible contact with MRAPs at public displays will be well supervised to prevent accidental injury. Consequently, there will be minimal impacts on the health and safety to the general (non-military) population.

One variant of the MRAP design solution contains explosive materials. For this variant, the MRAP is required to go through the Joint Services Weapons Safety Review (JSWSR) Board review process, which provides an independent technical safety evaluation of DoN weapon acquisition and improvement programs. The MRAP JPO will obtain all appropriate safety recommendations from the JSWSR to ensure that explosive safety issues are addressed.

The mitigation measures being implemented to eliminate or reduce hazards to operational users of the MRAP are consistent with the need to provide increased protection to combat forces as quickly as possible. Residual risks to the operational users (risk that remains after mitigation measures are applied) are identified and managed IAW the established DoD process for fielding military systems. In all cases, the decision to field a system with known hazards to operators is made at management levels appropriate to the seriousness of the risk associated with the hazard and with the concurrence of the operational user.

5.13 Demilitarization and Disposal

The vehicle demilitarization and disassembly will follow the MRAP FoV Demilitarization and Disposal Plan (Version 2.1 dated September 2009) as well as the DoD 4160.21-M, *Defense Reutilization and Disposal,* and DoD 4160.21-M-1, *Defense Demilitarization Manual*. Each of the variants will have a detailed D&D description located in the MRAP D&D Plan. Disposal procedures are handled IAW guidelines in DoD Instruction (DoDI) 4160.21. These guidelines apply to all DRMS facilities, DRMO locations and Demilitarization Centers used to execute the MRAP D&D Plan.

D & D will be handled according to the following priority:

1. Reutilization of materials within DoD
2. Transfer to other Federal agencies
3. Donation to qualified state and non-profit organizations, and
4. Sale to the public including recyclers

During the demilitarization process, vehicles will be stripped of all easily removable, unclassified components that will be retained, disposed of or demilitarized in accordance with the MRAP D&D plan. All GFE will be removed from the MRAP variants prior to demilitarization.

Personnel will then demilitarize the remaining vehicle structure. Components that contain hazardous materials, such as hexavalent chromium pretreatment, cadmium plating or beryllium, will be disposed of in accordance with federal, state and local laws and regulations. Other major subsystems, such as tires, power pack, fuel tanks and batteries, will also be removed and every effort would be made to reutilize serviceable components.

During disassembly, vehicles may still contain motor oil, JP-8 fuel, hydraulic fluids, engine fluids and transmission fluids. These fluids will be separately drained from the vehicles and placed into appropriate containers. The containers will be stored in compliance with federal, state and local regulations and laws. Some small amounts of residual fluids and lubricants may drip onto the shop floor. Personnel will use absorbent material to clean up such spills and store the waste materials in compliance with federal, state, and local laws and regulations. Appropriate test methods should be used on any POLs that may be reclaimed for further use, as they may contain contaminants and require treatment prior to use.

For the MRAP, hull disassembly will be accomplished by cutting (by torch or other similar tool) the vehicle armor into pieces. Such a cutting process would generate toxic fumes through the heating of the hull's metal substrate. Although a risky process, safe working practices have been developed to protect workers and the environment. These precautions range from proper ventilation of the work area to remote control of the cutting process. Current standard operating procedures and regulations effectively mitigate environmental and worker health impacts. The disposal facility will determine which components are appropriate to be transferred to a recycling facility.

D&D of the MRAP vehicles will be conducted IAW DoD 4160.21-M, DoD 4160.21-M-1, and all applicable environmental laws and regulations. Recycling is the preferred disposal method and will be used to the maximum extent possible. At this time, there are no anticipated direct, indirect or cumulative environmental impacts associated with the D&D of the Army MRAP vehicles.

6.0 Environmental Consequences - No Action Alternative

Under the no action alternative, production of MRAP vehicles would not occur. It can be expected that the appropriate OEM and Subcontractor facilities would continue to manufacture military vehicles, and many of the manufacturing processes would be similar. The volume of vehicles manufactured at these facilities would be in lower quantities, and as a result, the amounts of air emissions, wastewater, hazardous wastes, and non-hazardous wastes generated would be correspondingly lower.

For the no action alternative, no MRAP testing would occur. The test installations would, however, continue to host other ground vehicle system testing including tests for current vehicles modified for enhanced vehicle and occupant survivability. These tests would have similar environmental impacts on the installation as previously experienced.

With this alternative, Army MRAP vehicle training and fielding would not occur. As a result, there would be no environmental impacts associated with this vehicle system. The installations identified in this PEA would continue to host military vehicles. Based upon previous observations, the deployment of other vehicle systems would have similar environmental impacts as the MRAP vehicles on the installations.

7.0 Conclusion

At a programmatic level, though environmental risks are expected to be minor for the life cycle of the Army MRAP vehicles, mitigation measures have been identified as part of this analysis. In addition, careful adherence to federal, state, and local environmental regulation and installation plans and procedures including spill contingency plans, pollution prevention plans and testing and training range procedures should preclude any potential environmental impacts associated with the proposed action: production, testing, fielding, and demilitarization/disposal of the JMVP. It is expected that minor impacts to air quality, water quality, hazardous materials and waste, health and safety, and geology and soils could potentially occur at facilities where Army MRAP vehicles are tested, trained or operated/deployed, but there are no significant impacts to the environment anticipated from the continuation of the JMVP. Table 9, on the following page, summarizes the impacts to each ERA by life-cycle phase.

IAW the implementing regulations for the NEPA (40 CFR 1508.7), cumulative impacts must be addressed in an EA. A cumulative impact is the "…impact on the environment, which results from the incremental impact of the action when added to other past, present and reasonably foreseeable future actions…" Although no cumulative impacts have been identified in this PEA, individual installation NEPA analyses would consider cumulative impacts for Army MRAP activities at their specific locations if they are

considered significant.

Based upon this analysis, it is determined that the proposed action would not have a significant impact upon the environment. As a result, the preparation of an EIS is not required, and a draft Finding of No Significant Impact (FONSI) has been prepared.

Table 9. Summary of Environmental Impacts

Environmental Resource Areas	Production	Training	Testing	Fielding	D&D
Soil					
Land Use					
Air Quality					
Water Quality					
Noise					
Solid Waste					
HAZMAT					
Socioeconomics					
Cultural/Biological Aesthetic/Visual					

Insignificant Impact
Minimal Impact
Significant Impact

8.0 List of Persons Contacted/Agencies Consulted

JPO MRAP:

Mr. Robert Adkins – Safety Project Officer (EG&G Technical Services)
Ms. Connie Yarber – ESOH Engineer (EG&G Technical Services)
Mr. David Kozlowski – Systems Engineer, RG31 Team (Booz/Allen/Hamilton)
Mr. Steven Park – JPO MRAP Vehicle Program Support Team (Coalescent Technologies)
Ms. Kim Yarboro – Associate Program Manager, Cougar
Mr. Andrew Walden – Test and Evaluation Lead (EG&G Technical Services)

TARDEC:

Ms. Michelle Davis – Materials and Environment Team
Ms. Pam Khabra – Materials and Environment Team
Mr. Steve McCormick – Fire Suppression
Mr. Ed Samland – Materials and Environment Team

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9.0 List of Preparers

Prospective Technology, Incorporated
Geoffrey Hoerauf
Jean B. Lloyd

Appendix A: MRAP Vehicle Characteristics

MRAP Vehicle Characteristics

Variant	Gross Vehicle Weight (Pounds)	Curb Vehicle Weight (Pounds)	Payload Weight (Pounds)	Height (Inches)	Width (Inches)	Length (Inches)
Caiman	34,500	29,296	6,600	112	98	274
RG33	36,000	33,000	5,000	112	99	263
Cougar CAT I	38,000	32,000	6,000	104	102	233
Cougar CAT II	52,000	39,000	13,000	104	102	279
Buffalo	50,660	45,320	24,000	125	101	344
RG31(Mk5E)	22,487	19,842	4,400	104.3	97.2	236.2
RG31(Mk5)	31,300	29,842	4,400	104.3	97.2	236.2
M-ATV	37,000	24,500	4,000	123.9	98.1	233.8
MaxxPro	43,500	34,480	3,520	108	108	255

Appendix B: List of Hazardous Materials in MRAP Manufacturing/Integration and Maintenance

Hazardous Materials Used in Manufacturing and Maintenance Activities for Caiman

Component	Hazardous Constituent(s)	Use
Methyl Alcohol	Methyl alcohol	Windshield Solvent
Heavy Duty Adhesive	Acetone, Hexane, Isobutane	Hull
Misty Glass and Mirror Cleaner	Isobutane, Dimethylmethane, Ammonium hydroxide, Isopropanol	Cleaning
MIL-L-2105 (Lub. Oil)	Mineral oil	Powertrain
Isopropyl alcohol	Isopropyl alcohol	Cleaning
Diesel fuel	Petroleum distillates	Fuel
MIL-C-22750 Green	2-Butanone, Toluene, Light Aromatic Naptha, Crystalline silica, Diluent 8, Silicone dioxide, Green pigment (Cu)	Interior Topcoat
Cutting oil	Petroleum distillates, Propane, Isobutane	Mechanical
MIL-P-53030	n-Butyl alcohol, C8&10 Aromatic compounds, Zinc phosphate, Nitroethane	Paint Primer
Exide battery	Lead, Antimony, Arsenic, Sulfuric acid	Powertrain
15W40 Engine Lubricating Oil	Petroleum distillates	Powertrain
No. 2 Diesel fuel	Petroleum distillates	Fuel
80W90 Gear Oil	Petroleum distillates	Powertrain
Pro Lock Pipe Sealant	Polyfunctional Dimethyacrylate esters	Mechanical
TT-E-529G Yellow Enamel	Petroleum distillates, Xylene, Aliphatic hydrocarbons, Magnesium silicate	Paint
MIL-P-53022	Methyl Isobutyl Ketone, Xylene 1-methoxy-2-Propanol	Paint Primer
MIL-P-53039 (Tan 686)	Methyl Isoamyl Ketone, Prepolymer of Hexamethethylene Diisocynate, Yellow Iron Oxide, Silica, n-Butyl Acetate, Hexamethyl;ene Diisocynate, C8-C10 Aromatic Hydrocarbons	CARC
Nuts ‘N’ Bolts 225	Trialkylamine, Cumene Hydroperoxide	Mechanical
Anti-seize Lubricant (MIL-A-907E)	Petroleum oil, Copper powder	Mechanical
White Enamel	Toluene, Acetone, Xylene, Propane, Isobutane, n-Butane, Ethylbenzene, Petroleum Hydrocarbon mix	Paint
241 Loctite Adhesive sealant	Polyglycol dimethacrylate, polyglycol dioctanoate, Cellulose ester, Cumene Hydroperoxide, Saccharin	Hull
Electro 140 Contact Cleaner	Mineral Spirits, 3-Methoxy-3Methyl-1-Butanol	Cleaning

Component	Hazardous Constituent(s)	Use
Lubricating Oil 15W50	1-Decene, Fatty esters, Petroleum distillates, Alkyl amines, zinc, 2-Propenoic acid	Powertrain
Anti-Freeze (MIL-A-46153)	Ethylene Glycol	Engine Coolant
Polyurethane Coating (Black 37030)	Xylene, Propylene Glycol /Methyl Ether Acetate, Toluene, Silica, Methyl Ethyl Ketone, Cristobalite, Diatomaceous Earth, n-Butyl Acetate, 1,6-Hexane Methyl Diisocynate, Polymeric Hexamethylene Diisocynate	CARC
Polyurethane Coating (Aircraft Black 3703)	Xylene, Propylene Glycol /Methyl Ether Acetate, Carbon Black, Methyl Ethyl Ketone, Toluene, Cristobalite, Diatomaceous Earth, Silica	CARC
Polyurethane Coating (#7542)	n-Butyl Acetate, Hexamethylene Diisocynate, Polymer of Hexamethylene Diisocynate	CARC
Polyurethane Coating (Brown 383)	Xylene, Propylene Glycol /Methyl Ether Acetate, Methyl Ethyl Ketone, Toluene, Quartz, Cristobalite, Diatomaceous Earth, Amorphous Hydrated, Chromium (III) Oxide	CARC
Polyurethane Coating (Green 383)	Propylene Glycol /Methyl Ether Acetate, Toluene, Diatomaceous Earth, Amorphous Hydrated, Chromium (III) Oxide, Cobalt, Titanium Dioxide, n-Butyl Acetate, Hexamethylene Diisocynate, Polymeric Hexamethylene Diisocynate	CARC
Polyurethane Coating (Olive Drab 34088)	Xylene, Propylene Glycol /Methyl Ether Acetate, Methyl Ethyl Ketone, Diatomaceous Earth, Talc, Amorphous Hydrated, Toluene, n-Butyl Acetate, Hexamethylene Diisocynate, Polymeric Hexamethylene Diisocynate	CARC
Polyurethane Coating (Sand 33303)	Propylene Glycol /Methyl Ether Acetate, Xylenes, Methyl Ethyl Ketone, Cristobalite, Diatomaceous Earth, Amorphous Hydrated, Chromium (III) Oxide, Titanium Dioxide, Toluene, n-Butyl Acetate, Hexamethylene Diisocynate, Polymeric Hexamethylene Diisocynate	CARC
Quick Start Starting Fluid	Carbon Dioxide, Diethyl Ether, Heptane, Mineral Oil	Powertrain
JP-4 Fuel Standard	Methylene Chloride, JP-4	Fuel
JP-5 Fuel Standard	Methylene Chloride, Kerosene	Fuel
JP-8 Turbine Fuel	JP-8, Kerosene, Ethylene Glycol Monomethyl Ether	Fuel
Engine Oil SAE 30 (MIL-L-2104)	Petroleum, Zinc Salt of Diakyldithiophosphoric Acid	Powertrain
P-D-680 Type III	Stoddard Solvent	Cleaning
A-A-59745	Zinc Rich Primer	Paint Primer

Hazardous Materials Used in Manufacturing and Maintenance Activities for MaxxPro

Compound	Hazardous Constituent(s)	Use
JP-8 or DF-2	Benzene, Dietylene glycol monoethyl ether, Napthalene, 1,2,4-timethylbenzne, Toluene, Xylenes	Engine Fuel
15W40 Rotella	Heavy Duty Motor oil, Highly refined petroleum oils, Zinc Dialkyldithiophosphate, Proprietary additives	Engine Lubricant
Water / Ethylene Glycol (50/50)	Ethylene glycol, Proprietary additives	Engine Coolant
Sika 296 Glass Bonding Adhesive	Polyisocyanate prepolymer, Xylenes	Windshield To Metal Bonding Adhesive
Commercial Grade Windshield Washer Solvent	Ethyl alcohol, Ethylene glycol, Acetone	Windshield Washer Fluid
Lithium Complex Wheel Bearing Grease	Lube oil 500 SUS, Lithium 12 Hydroxyoctadecanoate, residual oils, Nonanedioic acid dilithium salt	Roller Bearing Lubricant
Emgard Synthetic Transmission Lubricant (SAE 50)	Non-listed	Transmission Lubricant
Heavy Duty Gear Oil		Lubricant
Dentax SAE 80W90 Gear Oil	Hydrotreated heavy paraffinic petroleum, hydrotreated residual oil	Differential Lubricant
DualLite Battery Electrolite	Lead – Lead oxides, Sulfuric acid Electrolyte	Battery Catalyst
LOC TITE Anaerobic Sealant	Dibasic acid ester resin, polyglycol dimethacrylate, Alkyl alcohol, Alkylene glycol, Cumene hydroperoxide, Quartz silica	Pipe Thread Compound
Dyna Spec MC Tan 686	Hexamethylene Diisocynate Homopolymer, Methyl Isoamyl ketone, Titanium Dioxide, Cristabolite, Crystalline Silica, Light Aromatic Petroleum distillates, 1,2,4-Trimethylbenzene, Butyl acetate, Isophorone Diisocynate, Chromium Oxide Green, Ferric oxide, Ethyl Benzene	Body / Component Protectant (Paint)
White Lithium Grease	Mineral Oil, Isohexanes, n-Hexane, Propane, Isobutane	Lubricant
Metal Wash Primer (DoD-P-15328)	2-Propanol, 1-Butanol, Chromium Zinc Oxide	Metal Cleaner

Compound	Hazardous Constituent(s)	Use
Primer Epoxy Coating	Toluene, Ethylbenzene, Methyl n-Propyl Ketone, Epoxy polymer, Quartz, Talc, Titanium dioxide	Metal Primer
Epoxy Polyamide – Compound B	4-Methyl-2-pentanone, Bisphenol A, 1-butanol, 1-Methoxy-2-Propanol, Mixed Xylenes, Ethyl Benzene	Metal / Paint Catalyst
Polyurethane CARC, 686 TAN	Toluene, Ethyl benzene, Xylene, Medium Aromatic Hydrocarbons, Naphthalene, Methyl Isobutyl Ketone, n-Butyl Acetate, isooctyl Acetate, Isophorone Diisocyanate, Hexamethylene Diisocynate, Quartz, Cristobalite, Titanium Dioxide, Colbalt Chromite Green Spinel	Body / Component Protectant (Paint)
Aliphatic Polyurethane, Type 2 Coating (MIL-C-46168)	Toluene, Ethyl benzene, Xylene, n-Butyl Acetate, Methyl Ethyl Ketone, 1-Methoxy-2-propanol Acetate, Methoxymethylethoxypropanol Acetate, Cristobalite, Talc, Titanium Dioxide, Colbalt Chromite Green Spinel, Chromium (III)	Body / Component Protectant (Paint Sealant)
GRAFO 112X	Mineral oil	Gear Lubricant Additive
Epoxy Thinner	2-Butanone, 1-methoxy-2-Propanol, 4-methyl-2-pentanone	Metal Primer Catalyst
Sika Flex 255 FC Polymer	Isophrone Diisocynate, Methylene bisphenyl Isocynate, polyisocynate Prepolymer, Xylene	Metal Sealant
Epoxy Polyamide, Component B	4-Methyl-2-pentanone, Bisphenol A, 1-butanol, 1-methoxy-2-propanol, Xylenes, Ethyl benzene	Metal Primer Catalyst
Mobile DTE 12M	Hyrotreated Light Naphthenic Distillate	Lubricant
Tan 686A Moisture Cure CARC	Hexamethylene Diisocyanate Homopolymer, Methyl isoamyl Ketone, Titanium Dioxide, Cristabolite, Crystalline Silica, Light Aromatic Petroleum distillate, Butyl acetate, 1,2,4 Trimethylbenzene, Isophorone Diisocynate, Chromium Oxide green, Ferric oxide, Ethyl Benzene	Military Grade Paint
Aliphatic Polyurethane CARC Catalyst	n-Butyl Acetate, Hexamethylene Diisocynate, Hexamethylene Diisocynate polymer	Body / Component Protectant (Paint Catalyst)
Type II Ordnance Epoxy Primer (Hardener)	Toluene, p-Chlorobenzotrifluoride, 1-Butanol, 1-Methoxy-2-propanol, Phenylmethanol, Methyl Ethyl Ketone,	Metal Primer Catalyst

Compound	Hazardous Constituent(s)	Use
	Methyl n-Propyl Ketone, Methyl n-Amyl Ketone, Tri(dimethylaminomethyl) phenol, 4,4'-isopropylidenediphenol, Diethylenetriamone, Epoxy polymer, Polyamide, Polyamine	
Ordnance Metal Wash Primer (Component B)	2-Propanol. Phosphoric acid	Metal Catalyst, Cleaner And Primer
Mobile DTE 12	Hyrotreated Light Naphthenic Distillate	Lubricant
Formulashield Brake Fluid	Glycol ethers, Polyethylene glycol, Diethylene glycol, Trietheylene glycol	Brake Fluid
FM 200 (FE227)	1,1,1,2,3,3,3-Heptafluoropropane	Fire Extinguishing Agent
Spirax HD Oil 85W140	Highly refined petroleum oils, olefin sulfide	

Hazardous Materials Used in Manufacturing and Maintenance Activities for M-ATV

Compound	Hazardous Constituent(s)	Use
JP-8 or DF-2	Benzene, Dietylene glycol monoethyl ether, Napthalene, 1,2,4-timethylbenzne, Toluene, Xylenes	Engine Fuel
Purple K	Potassium Bicarbonate, Mica dust, magnesium aluminum silicate	Crew compartment handheld fire extinguishing agent
Water / Ethylene Glycol (50/50)	Ethylene glycol, Proprietary additives	Engine Coolant
Black Widow	Silcone Dioxide, Quartz	Fuel tank and tire fire extinguishing agent
STATX	Potassium Nitrate, DCDA, Organic Resin	Engine compartment fire extinguishing agent
Lord 406 Acrylic Adhesive	Methyl methacrylate, Methacrylic acid, N,N-Dimethylaniline	Metal and plastic adhesive used on cab skins
Lord Accelerator 19GB	Benzoyl peroxide, epoxy resin, diisobutyl phthalate	Part 2 of Lord 406 Acrylic Adhesive
Dow 732 Clear Sealant	Methyltriacetoxysilane, ethytriacetoxysilane	Bonding gaskets in heating and refrigeration units
Sikaflex 221	Xylene	Adhesive sealant for components
Lead-Acid Battery	Lead – Lead oxides, Sulfuric acid Electrolyte	Battery Electrolyte
MIL-DTL-53039 Type II Black 383 CARC	Hexamehtylene Diisocyanate, 1-chloro-4-benzene, Cristoblite crystalline silica, Tertiary butyl acetate, Methyl amyl ketone, Quartz, Amorphous silica, Iron oxide pigment, Carbon black	Vehicle Paint
MIL-DTL-53039 Type II Tan 686A CARC	Hexamehtylene Diisocyanate, 1-chloro-4-benzene, Cristoblite crystalline silica, Tertiary butyl acetate, Methyl amyl ketone, Quartz crystalline silica, Amorphous silica, Iron oxide pigment, Titanium dioxide	Vehicle Paint
MIL-DTL-53022 Type II White High Solids Epoxy Primer – Part A	Crystalline silica, Titanium dioxide, Silaceous extender pigment, Zinc compound, Epoxy resin, Methyl isoamyl ketone, 1-Methoxy-2-Propanol	Vehicle Paint Primer
MIL-DTL-53022 Type II White High Solids Epoxy Primer Catalyst – Part B	1,2,4-Trimethylbenzene, Aromatic Hydrocarbons, Diethylenertriamine, Epoxy resin, 1-Methoxy-2-propanol, Methyl isobutyl ketone	Vehicle Paint Primer

Compound	Hazardous Constituent(s)	Use
TEF-Gel	Polytetrafluoroethylene	Corrosion prevention and anti-seize compound
SG-510A Anti-Corrosion Spray	Petroleum distillate, stoddard solvent	Rust inhibition and corrosion prevention
745 Windshield Washing Fluid	Methanol	Windshield washing
Loctite 242 Threadlocker	Polyglycol dimethacrylate, Polyglycol oleate, Saccharin, Cumene hydroperoxide, Propylene glycol, Amorphous silica, N,N-Dialkyltoluidine, Titanium dioxide	Thread locking adhesive
Loctitie 592 Pipe Thread Sealant	Polyglycol dimethacrylate, Polyglycol dioctanoate, Octanol, Cumene hydroperoxide, Mica Silica, Amorphous silica, Organic Esters, Titanium dioxide, Bisphenol A fumarate resin	Thread sealant used on oil, coolant, fuel, and hydraulic units and sensors
Loctite 567 Pipe Thread Sealant	Polyglycol dimethacrylate, Polyglycol laurate, Polyethylene, Epoxy Resin, Polytetrafluoroethylene, Cumene hydroperoxide, N,N-Dialkyltoluidines, Amorphous silica, Saccharin, Titanium dioxide, Bisphenol A fumarate resin,	Sealant for stainless steel, galvanized, brass, and plated fittings
SG-50A Anti-Corrosion Compound	Petroleum distillate, stoddard solvent	Rust inhibition and undercoating
R-134a	1,1,1,2-Tetrafluoroethane	Refrigerant
TP-3820 Dye		Dye for detecting refrigerant leaks
FM 200 (HFC227)	1,1,1,2,3,3,3-Heptafluoropropane	Fire Extinguishing agent for AFES in crew compartment
Metal Wash Primer (DoD-P-15328)	2-Propanol, 1-Butanol, Chromium Zinc Oxide	Metal Cleaner

Hazardous Materials Used in Manufacturing and Maintenance Activities for RG33

Compound	Hazardous Material(s)	Use
Acid, Muriatic		De - Oxidation dip
Acid, Nitric		De - Oxidation dip
Acid, Sulfuric		Dip tanks
Adhesive, Rubber		Contact cement
Anti-Seize, MIL-A-907		Thread Lubricant
Base, Green		Interior paint
Catalyst, Epoxy		Paint Catalyst
Catalyst, Green		Interior paint
Caulking Compound		Water Proofing
Cleaner		Cleaning Solution
Coating, Conversion		Alodine dip
Coating, Conversion, Alodine		Alodine Dip
Corrosion Preventative		WD-40 - misc. lubricate and or rust prevention
Deflocculator		Removes particles from suspension in a bath or dip tank.
Epoxy, White Gloss, (MIL-PRF-22750)	Titanium Dioxide, Epoxy Resin, Methyl Acetate, Butyl Acetate, Methyl Amyl Ketone, Trifluoromethyl, Benzyl Alcohol, TEPA, Methyl Amyl Ketone	
Epoxy, Non-Skid Particles		Provides non-skid, abrasive surface to prevent personnel slipping. Used with 12308492-H, 12308493-H & 12308493-R
Epoxy, Non-Skid Resin (5 gal.)		Provides non-skid, abrasive surface to prevent personnel slipping. Used with 12308492-H, 12308493-H & 12308493-P
Epoxy, Non-Skid Hardener (5 gal.)		Provides non-skid, abrasive surface to prevent personnel slipping. Used with 12308492-H, 12308493-P & 12308493-R
Braycote 610	Calcium Sulphonate,	Grease, Misc. initial lubricant

Compound	Hazardous Material(s)	Use
	Phosporodihioc acid, Naphthenic acids, Zinc salts	
Hardener, Finish		Provides non-skid, abrasive surface to prevent personnel slipping. Used with 12308493-H, 12308493-P & 12308493-R
Insulating Compound, Electrical		Sealing, electrical
Insulation Silicone		Sealing, electrical
Lacquer, Acid Resist		Battery box coating
Lacquer, Stop-off		Used for masking
Lube, Solid Film		Lubricant
Lube, Water Pump		Water Pump Lube
Paint, Polyurethane		Stenciling
Paint, Polyurethane, 383 Green	Trifluoromethyl, Homopolymer of Hexamethylene Diisocynate, Tertiary Butyl Acetate, Cristoblite Crystalline Silica, Titanium Dioxide, Methyl Amyl Ketone, Diatomaceous earth, Yellow Iron Oxide Pigment	External finish paint
Penetrant, Liquid		Surface Crack detector
Penetrant, Liquid		Used to inspect for surface cracks
Penetrant, Liquid		Used to inspect for surface cracks
Petroleum Jelly		Assembly lubricant
Plastisol Primer		Plastisol is a rubbery coating used to provide a gripping surface, simple insulation or machined surface protection.
Plastisol, Primer		Plastisol is a rubbery coating used to provide a gripping surface, simple insulation or machined surface protection.
Polyurethane, White Paint		Interior paint
Primer, Sealant		Used with RTV sealant C12750. Sealant/adhesive
Primer, Wash Kit	Talc, Zinc Compounds, Yellow Iron	Coating/surface preparation

Compound	Hazardous Material(s)	Use
	Oxide Pigment, 2-Butoxyethanol	
Remover, Lacquer, Stop-off		removes lacquer used for masking
Sealant, Gasket		Gasket adhesive
Sealant, Gasket		Gasket adhesive
Sealant, Pipe Thread		Pipe thread sealant
Sealant, Silicone		Hull Sealant
Sealant, Surface, Primer		Primer for thread seal.
Sealant, Tamper		Torque Putty
Sealant, Thread		Thread adhesive and sealant
Sealant, Silicone, MIL-A-46106		rubber-adhesive sealant
Sodium Hydroxide		Used in dip tanks
Solvent Blend, 33/50		Paint Solvent clean-up
Solvent Primer, Adhesive		Paint thinner and clean-up solvent
Solvent Primer, Epoxy Resin (MIL-P-53022)	Titanium Dioxide, Propyl Acetate, Crystalline Silica, Zinc Compound, Methyl Acetate, Methyl Amyl Ketone, Trifluoromethyl, Butyl Acetate	Paint
Solvent, Cleaning		Cleaning Solvent
Solvent, Dry Clean		Cleaning solvent
Talc, Technical T1		Rubber seal lubricant
Thinner, Stop-Off		Thinner for removing stop-off
Thinner, Wash Primer		Surface preparation for paint used mainly in remanufacture.

Hazardous Materials Used in Vehicle Fluids for RG33

Component	Hazardous Material(s)	Use
Braycote 610	Calcium Sulphonate, Phosporodihioc acid, Naphthenic acids, Zinc salts	Grease, Misc. initial lubricant
15W40 Engine Oil	Petroleum distillates, Zinc and Zinc compounds	Engine Lubricant
SAE 20W50	Petroleum distillates, Zinc and Zinc compounds	Lubricant
Hawker Lead Acid Battery	Lead, Lead Dioxide, Sulfuric Acid Electrolyte	Battery
FM-200	1,1,1,2,3,3,3-Heptafluoropropane	Fire Extinguishing Agent
TES-295 SYN	Mineral oil, Base oil	Transmission Fluid
R-134a	1,1,1,2-Tetrafluoroethane	Refrigerant

Hazardous Materials Used in Manufacturing and Maintenance Activities for RG31

Compound	Hazardous Constituent(s)	Use
Loctite 243 Thread Sealant	Maleic Acid	Fastener Sealant
	Cumene Hydroperoxide	
	1-Acetyl-2-phenylhydrazine	
Loctite 518 Sealant	1-Octanol	Sealant
	Cumene Hydroperoxide	
Sikaflex-255	Xylene	Sealant
	Calcium oxide	
	3-isocyanatomethyl-3,5,5-trimethylcyclohexylisocynate	
Terostat 92 Adhesive/Sealant	4,4’-methylendiphenyl diisoyanante	Adhesive
	Xylene	
	Dibutyltin dilaurate	
	Naptha, hydrotreated heavy	
Thinning Solvent	Toluene	Paint Solvent
Plascon Automotive APU 999	Acrylic resin	Adhesive
	Xylene	
	Butyl acetate	
EPIWash Strontium Chromate Primer	n-Butanol	Metal Wash Primer
	Isobutanol	
	Isopropyl alcohol	
	Diethylene triamine	
	Toluene	
	Xylene	
EnGen ATF III	Phosphorodithoic acid	Transmission Fluid
	C1-14-Alkyl Esters	
	Zinc salts	
15W40 Engine Oil	Petroleum oil	Engine Lubricant
	Zinc alkyldithiophosphate	
80W90 Gear Oil	Petroleum oil	Gear Oil
Engine Coolant	Ethanediol	Engine Coolant
	2-ethyl-hexanoic sodium salt	
Chemserve Solvene 222	Trichloroethylene	Cleaning Solvent
	Tetrachloroethylene	

Hazardous Materials Used in Manufacturing and Maintenance Activities for Cougar and Buffalo

Compound	Hazardous Constituent(s)	Use
Steel Spec Fast Dry Finish Coat	Naptha, Ethylbenzene, Xylene, 2-Butoxyethanol, quartz, Calcium Carbonate	Vehicle Painting
Corothane II Satin Polyurethane (Part A)	Ethylbenzene, Xylene, Methyl Isoamyl Ketone, n-Butyl Acetate, Hexamethylene Diisocyanate, Hexamethylene Diisocyanate Polymer	Vehicle Painting
MIL-P-53022B, Type II Ordnance Epoxy Primer, Buff	Toluene, Ethylbenzene, Methyl n-Propyl Ketone, Proprietary Epoxy Polymer, Epoxy Polymer, Quartz, Talc, Titanium Dioxide	Vehicle Painting
MIL-P-53022B Ordnance Epoxy Primer, Hardener	Toluene, p-chlorobenzotrifluoride, 1-Butanol, 1-Methoxy-2-propanol, Phenylmethanol, Methyl Ethyl Ketone, Methyl n-Propyl Ketone, Methyl n-Amyl Ketone, Tri (dimethylaminomethyl) Phenol, 4,4'-Isopropyllidenediphenol, Diethylenetriamine, Epoxy Polymer, Polyamide, Poyamine	Vehicle Painting
MIL-P-53022 B, Type 1 Ordnance Epoxy Primer (Part A), White	Toluene, 1-Butanol, 1-Methoxy-2-propanol, Methyl Ethyl Ketone, Epoxy Polymer, Quartz, Talc, Titanium Dioxide	Vehicle Painting
MIL-P-53022B Type I Lead & Chromate Free Epoxy Primer (Component B)	Toluene, 1-Butanol, 1-Methoxy-2-propanol, Diethylenetriamine, Epoxy-Amine Polymer	Vehicle Painting
MIL-C-53039A AM-2 Ordnance Polyurethane CARC (1.5 VOC, HAPS free, Black)	p-Chlorobenzotrifluoride, Methyl Isoamyl Ketone, n-Butyl Acetate, Isooctyl Acetate, Isohorone Diisocyanate, Hexamethylene Diisocyanate Polymer, Quartz, Christobalite	Vehicle Painting
MIL-C-53039A AM-2 Ordnance Polyurethane CARC	p-Chlorobenzotrifluoride, Methyl Isoamyl Ketone, n-	Vehicle Painting

Compound	Hazardous Constituent(s)	Use
(1.5 VOC, HAPs Free, Tan)	Butyl Acetate, Oxo-Tridecyl Acetate, Isohorone Diisocyanate Polymer, Quartz Christobalite, Titanium dioxide, Cobalt Chromite Green Spinel, Chromium III	
MIL-T-81772B, Type I Urethane Thinner	Toluene, Ethylbenzene, Xylene, Methyl Ethyl Ketone, n-Butyl Acetate, 1-Methoxy-2-propanol Acetate	Vehicle Painting
MIL-T-81722B,Type II Ordnance Epoxy Reducer/Thinner	1-Methoxy-2-propanol, Methyl Ethyl Ketone, Methyl Isobutyl Ketone	Vehicle Painting
Methyl Ethyl Ketone	Methyl Ethyl Ketone	Vehicle Painting
Acetone	Acetone	Vehicle Painting
Paint, Heat Resisting TAN#33446, MIL-P-14105	MICA, Titanium Dioxide, Xylene, Christoblite Chrystalline Silica, Silicone Resin, Trivalent Chrome, Light Aromatic Naphtha, Siliceous Extender Pigment, Inorganic Frit (Antimony Compound), Antimony, Chrome & Nickel Compound, Ethylbenzene, Butyl Alcohol	Muffler Paint
MIL-PRF-22750F Coating, Epoxy, High-Solids (Part A), Black 37038	Ethylbenzene, Medium Aromatic Hydrocarbons, Naphthalene, Methyl Ethyl Ketone, Methyl n-Amyl Ketone, Epoxy Polymer, Talc, Carbon Black	Vehicle Painting
MIL-PRF-22750F Coating, Epoxy, High-solids (Part B), Hardener	2-Propanol, 4-Nonylphenol, 1,3-Benzenedimethanamine, Polyamine	Vehicle Painting
Staurolite Sands Starblast	Staurolite, Titanium Minerals, Quartz, Zircon, Kyanite	Sand Blasting
LPS Precision Clean Aerosol	Sodium Metasilicate, Dipropylene Glycol Methyl Ether, Propane/Isobutane Propellant	Degreasing
WD-40 Aerosol	Aliphatic Petroleum Distillates, Petroleum Based Oil, LVP Hydrocarbon Fluid, Carbon Dioxide	Various
New Rapid Tap	Paraffin (chlorinated), Mineral Oil, Metal-Cutting-Fluid	Metal Cutting Lubricant

Compound	Hazardous Constituent(s)	Use
	Additive, Soybean Oil-epoxidized, Olefin Sulfide, Cinnamon Oil Perfume	
Weldment Contact Cement	Light Aliphatic Naphtha, Volatile Organic Compound, Hexane, Toluene, Acetone	Cement Parts
Hydraulic Fluid	1-Decene tetramer	
Spray Paint, Semi-flat Black	Acetone, LPG, Xylene, Toluene, Aliphatic Petroleum Distillates, Naphtha, Ethylbenzene, 1,2,4-Trymethylbenzene, Pigment Black	Interior Paint
Spirax EW 75W-90	Heavy Duty Gear Oil, Olefin Sulfide, Additives	Gear Oil
Shellzone Antifreeze	Ethylene Glycol, Deionized Water, Phosphoric Acid	Antifreeze
Formulashell SAE 10W-30	Petroleum Oils, Additives (zinc)	Motor Oil
Formulashell ATF Mercon/Dexron III-DONAX TG	Automatic Transmission Fluid	Transmission Fluid
R-134a	1,1,1,2-Tetrafluoroethane	Air Conditioning Refrigerant
ABC Dry Chemical Fire Extinguisher	Monoammonium Phosphate, Ammonium Phosphate, Mica, Clay, Amorphous silica, Dye	Fire Suppression
Bonderite 7400	Substituted polyhydroxy aromatic compound, 2-Propanol, 1-propoxy, Manganese Compound, Hexafluortitanic acid, Phosphoric acid	Metal Pretreatment
Batteries	Lead, Sulfuric Acid, Polypropylene, Antimony, Tin, Calcium, Arsenic	Batteries

Appendix C: List of Fire Suppression Agents

Due to the fast pace of the program, the government purchased the MRAP vehicles with the fire suppression systems that were commercially available within the systems. As the program has progressed, various upgrades and retrofits have been made or are being made to the fire suppression systems. Therefore, different types of fire suppressants may be used within the fleet of each vendor's vehicles. The table below lists the possible fire suppressing agents that may be present in each of the vehicles.

List of Fire Suppression Agents

Variant	Zone 1 Engine Compartment	Zone 2 Crew Compartment	Zone 3 Tires	Zone 4 Fuel
RG33	FM-200	FM-200	None	None
RG31 Mk5	HFC-125	FM-200	None	None
MaxxPro	FM-200 or Sodium Bicarbonate	Water Mist or FM-200	Lehavot Petrotech or Firetrace Black Widow Powder	Lehavot Monoammonium Phosphate or Firetrace Black Widow Powder
Caiman	Ansul Foray (Monoammonium Phosphate) or FM-200	None or FM-200	None	None or Firetrace Black Widow Powder
Cougar	Sodium Bicarbonate	FM-200	None	None or NCASE (Purple K)
Buffalo	Sodium Bicarbonate	FM-200	None	None
M-ATV	STATX Aerosol Generators	FM-200 (AFES) & Purple K (handheld)	Black Widow	Black Widow

Appendix D: List of Variant Vehicle Fluids

List of Variant Vehicle Fluids

Variant	Engine Oil	Trans. Oil	Transfer case	Power Steering	Fuel	Gear Oil	Refrig Oil	Engine Coolant
RG31	18.5 qt 15W40	15qt DexronIII	15W40	3.2 qt ATF220 Type A	51 Gal.	2.8 Gal 80W90	R-134a	28.5Q H20/EG
RG33	29.2qt 15W40	29qt 15W40	13.5qt 15W40	15W40	80 Gal	14-18qt 80W90	R-134a	11.7Q H2O/EG
Caiman	24.5qt 15W40	49.3qt 15W40	49.3qt 15W40	5qt	74 Gal	80W90	R-134a	H2O/EG
Cougar	22qt 15W40	29qt 15W40	17qt 80W90	6qt Dextron III	100 Gal	17 pt 85W120	R-134a	48Q H2O/EG
Buffalo	40qt 15W40	34qt 15W40	10 qt 75W90	4 pt 15W40	85 Gal	85W140	R-134a	33 qt H2O/EG
MaxxPro	30qt 15W40	19-29 qt TransSynd	4.5qt SAE 50W	5.5qt 15W40	57 Gal	50qt 85W140	R-134a	H2O/EG
M-ATV	20qt OE/HDO 15W40	36qt OE/HDO 15W40	6.75qt GO 85W140	9qt OE/HDO 10	40 Gal	22.6qt GO 80W90	R-134a	46qt H20/EG

Appendix E: MRAP Variant Vehicle Ground Pressures

Ground Pressure Results for Caiman at GVWR

Pressure Setting	Wheel Location	Tire Pressure (psi)	Specific Ground Pressure (psi)	Nominal Ground Pressure (psi)
Highway	L1	74	128.5	63.0
	R1	74	127.2	63.1
	L3	85	137.4	66.2
	R3	85	137.2	69.3
Cross-country	L1	50	103.8	46.0
	R1	50	105.4	45.9
	L3	60	120.6	49.7
	R3	60	115.6	53.3

Ground Pressure Results for RG33 at GVWR

Pressure Setting	Wheel Location	Tire Pressure (psi)	Specific Ground Pressure (psi)	Nominal Ground Pressure (psi)
Highway	R1	104	126.5	70.7
	L2	104	127.2	71.6
Cross-country	R1	75	108.4	60.5
	L2	75	105.4	63.1
Mud/sand	R1	45	80.7	47.5
	L2	45	86.5	48.4

Ground Pressure Results for RG31 at GVWR

Pressure Setting	Wheel Location	Tire Pressure (psi)	Specific Ground Pressure (psi)	Nominal Ground Pressure (psi)
Highway	L1	89	107.7	60.8
	R1	89	107.9	62.6
	L2	96	120.3	67.5
	R2	96	120.3	67.5
Track	L1	58	91.8	50.9
	R1	58	86.7	50.7
	L2	70	100.1	58.4
	R2	70	100.1	58.4
Sand	L1	37	72.8	43.8
	R1	37	75.6	42.7
	L2	40	78.7	44.7
	R2	40	78.7	44.7

Ground Pressure Results for MaxxPro at GVWR

Pressure Setting	Wheel Location	Tire Pressure (psi)	Specific Ground Pressure (psi)	Nominal Ground Pressure (psi)
Highway	R1	104	126.1	68.7
	R3	104	125.1	73.2
Cross-country	R1	75	108.6	60.0
	R3	75	113.5	63.5
Mud/sand	R1	45	82.3	47.1
	R3	45	85.6	51.3

Ground Pressure Results for Cougar A3C1 at GVWR

Pressure Setting	Wheel Location	Tire Pressure (psi)	Specific Ground Pressure (psi)	Nominal Ground Pressure (psi)
Highway	L1	89	107.7	60.8
	R1	89	107.9	62.6
	L2	96	120.3	67.5
	R2	96	120.3	67.5
Track	L1	58	91.8	50.9
	R1	58	86.7	50.7
	L2	70	100.1	58.4
	R2	70	100.1	58.4

Ground Pressure Results for M-ATV at GVWR

Pressure Setting	Wheel Location	Tire Pressure (psi)	Specific Ground Pressure (psi)	Nominal Ground Pressure (psi)
Highway	Front	84	101.6	57.4
	Rear	96	116.4	67.5
Cross-country	Front	59	82.6	53.1
	Rear	71	106.5	63.9
Mud/Sand/Snow	Front	33	64.9	36.6
	Rear	40	76.9	44.8
Emergency	Front	26	54.9	28.9
	Rear	32	70.7	35.5

Weight Distribution at Each Axle Location for Buffalo

Note: Ground Pressure Values for the Buffalo were not available, weight distribution values are provided for information purposes in lieu of the ground pressure values

Axle Location	Weight								
	Left Side			Right Side			Total		
	kg	lb	Percent	kg	lb	Percent	kg	lb	Percent
Aluminum Bar Armor Kit									
Front	5,670	12,500	25.5	5,770	12,720	25.9	11,440	25,220	51.4
Intermediate	2,450	5,400	11	3,010	6,640	13.5	5,460	12,040	24.5
Rear	2,680	5,910	12	2,675	5,900	12	5,355	11,810	24.1

Appendix F: Engine Emission Standards Referenced within this PEA

The US EPA in October 1997 adopted new emission standards for engine Model Year (MY) 2004 and later heavy-duty diesel truck engines. Engine manufacturers have the flexibility to certify their engines to one of the two options in Table F-1. All emission standards other than NMHC and NO_x applying to 1998 and later model year heavy-duty engines (Table F-2) will continue at their 1998 levels. Table F-3 contains a summary of the Euro III emission standards. Table F-4 contains a summary of the EPA Tier III non-road emission standards.

Table F-1: EPA Emission Standards for MY 2004 and Later HD Diesel Engines, g/bhp·hr

Option	NMHC + NO_x	NMHC
1	2.4	n/a
2	2.5	0.5

Table F-2: EPA Emission Standards for MY 1998 and Later Heavy-Duty Diesel Engines, g/bhp·hr

Year	HC	CO	PM
1998	1.3	15.5	0.10

Table F-3: Euro III Tier Emission Standards for Heavy-Duty Diesel Engines, g/kWh

Date	CO	NMHC	CH_4	NOx	PM
10/2000	5.45	0.78	1.6	5.0	0.16

Table F-4: EPA Emission Standards for Heavy Duty Diesel Non-road Engines Rated between 175 and 300 hp, g/kWh

Tier	Model Yr	NOx	HC	NMHC + NOx	CO	PM
Tier 1	1996	9.2	1.3	-	11.4	0.54
Tier 2	2003	-	-	6.6	3.5	0.20
Tier 3	2006	-	-	4.0	3.5	-

Appendix G: List of MRAP Variant Noise Levels

85 dB(A) Contour. The vehicles were centered over a level hard surface where the equipment was operated at low idle and high idle speed of 1500 rpm to determine the distance that engine noise would be 85 dB(A), the point at which hearing protection should be worn. Noise levels were taken at 30-degree increments around the equipment. Measurements were taken with the microphone located 1.5 meters above the ground plain in accordance with TOP 1-2-608. Hearing protection was not required when the vehicle was operated at low idle.

Results are reported in Tables G-1 through G-6.

Cougar/Buffalo Noise Levels

TABLE G-1.1. INSTRUMENTATION

ITEM	MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATION DATE, 2008	PERIOD, Yr
Sound Level Meter	Quest	1900	CC0020022	8 May	1
Micro Calibrator	Quest	QC20	QO9120010	8 May	1
Micro-phone	B&K	4936	2128674	8 May	1

TABLE G-1.2. 85 dB(A) CONTOUR DATA

	LOW IDLE		HIGH IDLE	
	AC, NBC OFF	AC, NBC ON	AC, NBC OFF	AC, NBC ON
ANGLE, Deg	dB(A) AT 6 INCHES	dB(A) AT 6 INCHES	DISTANCE, FT	DISTANCE, FT
30	79.9	79.6	17.0	17.0
60	79.4	79.9	4.4	4.4
90	76.9	77.0	1.5	1.5
120	74.3	74.2	0.0	0.0
150	72.4	73.2	2.4	2.4
180	68.4	70.5	0	0
210	67.2	76.2	1.2	1.2
240	72.2	73.4	0.0	0.0
270	75.3	75.9	0.0	0.0
300	79.6	78.9	4.0	5.9
330	77.3	77.4	14.2	15.0
360	85.0 at 3 ft.	85.0 at 3 ft.	19.5	19.5

Single hearing protection should be worn within 9.5 feet of the vehicle when operated at the high idle 1500 rpm.

RG 33 Noise Levels

Table G-2.1. INSTRUMENTATION

ITEM	MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATION DATE, 2008	PERIOD, yr
Sound Level Meter	Quest	1900	CC0020022	8 May	1
Micro Calibrator	Quest	QC20	QO9120010	8 May	1
Microphone	B&K	4936	2128674	8 May	1

TABLE G-2.2. 85 dB(A) CONTOUR DATA (LOW IDLE)

	LOW IDLE		HIGH IDLE	
	AC, NBC OFF	AC, NBC ON	AC, NBC OFF	AC, NBC ON
ANGLE, Deg	dB(A) AT 6 INCHES	dB(A) AT 6 INCHES	DISTANCE, Ft	DISTANCE, Ft
30	79.8	80.5	38.6	38.6
60	79.2	74.4	13.6	13.6
90	77.5	78.6	4.5	4.5
120	77.8	80.5	3.6	3.6
150	74.0	76.7	4.3	4.3
180	67.1	80.7	0.0	0.0
210	72.7	76.7	4.3	4.3
240	75.9	77.6	1.1	1.1
270	73.7	76.0	7.2	8.2
300	73.8	76.1	12.3	13.3
330	78.3	79.2	27.3	27.3
360	85.0 dB(A) at 15 ft	85.0 dB(A) at 15 ft	36	36

Single hearing protection should be worn within 61 feet of the vehicle when operated at the high idle 1800 rpm.

RG31 Noise Levels

Table G-3.1. INSTRUMENTATION

ITEM	MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATION DATE, 2008	PERIOD, yr
Sound Level Meter	Quest	1900	CC0020022	8 May	1
Micro Calibrator	Quest	QC20	QO9120010	8 May	1
Microphone	B&K	4936	2128674	8 May	1

TABLE G-3.2. 85 dB(A) CONTOUR DATA

	LOW IDLE		HIGH IDLE	
	AC, OFF	AC, ON	AC, OFF	AC, ON
ANGLE, Deg	dB(A) AT 6 INCHES	dB(A) AT 6 INCHES	DISTANCE, FT	DISTANCE, FT
30	80.3	85 at 2.6 ft.	81.8	81.8
60	80.0	82.3	83.7	83.7
90	81.5	82.4	85.0 at 3.2ft.	85.0 at 6.6 ft.
120	82.4	83.4	85.0 at 6.2 ft.	85.0 at 7.1 ft.
150	75.3	76.6	80.5	80.5
180	68.6	71.2	75.1	75.1
210	74.5	75.8	80.9	80.9
240	77.3	78.1	82.4	82.4
270	77.1	79.3	81.2	81.2
300	76.7	81.6	80.3	80.3
330	79.5	85 at 6 inches	80.2	80.2
360	85.0 at 6 inches	84.0	85.0 at 6 inches	85.0 at 6 inches

Single hearing protection should be worn within 7.1 feet of the vehicle when operated at the high idle 1500 rpm.

MaxxPro Noise Levels

Table G-4.1. INSTRUMENTATION

ITEM	MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATION DATE, 2008	PERIOD, yr
Sound Level Meter	Quest	1900	CC0020022	8 May	1
Micro Calibrator	Quest	QC20	QO9120010	8 May	1
Microphone	B&K	4936	2128674	8 May	1

TABLE G-4.2. 85 dB(A) CONTOUR DATA, A2F1

	LOW IDLE		HIGH IDLE	
	AC, OFF	AC, ON	AC, OFF	AC, ON
ANGLE, Deg	dB(A) AT 6 INCHES	dB(A) AT 6 INCHES	DISTANCE, FT	DISTANCE, FT
30	79.1	79.7	13.7	13.7
60	77.6	78.8	8.9	8.9
90	76.8	77.2	5.8	5.8
120	77.3	78.3	3.9	3.9
150	71.7	74.7	0	0
180	71.9	72.7	0	0
210	76.4	76.3	0	0
240	75.8	75.7	4.4	4.4
270	76.8	76.4	5.6	5.6
300	77.1	76.8	8.2	8.2
330	78.6	78.1	15.9	16.0
360	85.0 at 6 inches	85.0 at 6 inches	15.8	16.7

Single hearing protection should be worn within 16.7 feet of the vehicle when operated at the high idle 1500.

Caiman Noise Levels

Table G-5.1. INSTRUMENTATION

ITEM	MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATION DATE, 2008	PERIOD, yr
Sound Level Meter	Quest	1900	CC0020022	8 May	1
Micro Calibrator	Quest	QC20	QO9120010	8 May	1
Microphone	B&K	4936	2128674	8 May	1

TABLE G-5.2. 85 dB(A) CONTOUR DATA

	LOW IDLE		HIGH IDLE	
	AC, NBC OFF	AC, NBC ON	AC, NBC OFF	AC, NBC ON
ANGLE, deg	dB(A) AT 6 INCHES,	dB(A) AT 6 INCHES,	DISTANCE, Ft.	DISTANCE, Ft.
30	79.7	79.7	55.9	56.2
60	77.7	77.5	32.2	38.8
90	75.6	76.4	26.3	26.4
120	74.3	74.8	16.4	16.6
150	70.5	76.3	9.7	9.9
180	68.8	80.6	0.0	0.0
210	74.0	80.3	7.3	7.3
240	76.7	77.6	19.8	19.8
270	78.0	79.0	23.6	23.6
300	79.9	80.0	28.1	28.1
330	85.0	85.0	52.3	52.3
360	85.0 at 4 ft.	85.0 at 4 ft.	61	61

Single hearing protection should be worn within 61 feet of the vehicle when operated at the high idle 1800 rpm.

M-ATV Noise Levels

85 dB(A) Contour. According to MIL-STD-1474D, paragraph 5.1.1, single hearing protection is required when the sound level is 85 dB(A) or greater. An 85 dB(A) contour was measured to determine if and where single hearing protection (earplugs, noise muffs, ear canal caps, or noise-attenuating helmet) should be worn when working around the MRAP-All Terrain Vehicle. The vehicle was oriented with the front facing toward 0^{o}. Measurements were taken in 30^{o} increments moving clockwise from 0^{o}. The steady-state noise was measured with the vehicle operating at a low idle engine speed of 700 rpm and at the working idle engine speed of 1000 rpm. 85 dB(A) contour is shown in Table G-6.1.

Table G-6.1 85 dB(A) Contour data

ANGLE (DEG)	Low Idle		High Idle	
	dB(A)	DISTANCE, in.	dB(A)	DISTANCE, in.
30	81.1	6	85	46
60	81.3	6	85	97
90	82.8	6	85	150
120	82.7	6	85	118
150	76.7	6	85	32
180	75.0	6	82.4	6
210	72.0	6	77.7	6
240	77.3	6	81.0	6
270	78.4	6	83.3	6
300	78.0	6	83.5	6
330	81.0	6	85	22
360	83.9	6	85	70

Single hearing protection is not required when the vehicle is at low idle engine speed.

Single hearing protection should be worn within 12.5 ft of the vehicle when operating at high idle engine speed.

Appendix H: Finding of No Significant Impact (FONSI)

Finding of No Significant Impact (FONSI)
for the
Mine Resistant Ambush Protected (MRAP) Vehicle Program

AGENCIES: Joint Program Office (JPO) for the Mine Resistant Ambush Protected (MRAP) Vehicle

ACTION: Acquisition of the Army MRAP Vehicles

BACKGROUND:

In accordance with the National Environmental Policy Act (NEPA) and 32 CFR Part 651, *Environmental Analysis of Army Actions,* Final Rule; the Army Tank-Automotive Armaments Command (TACOM) LCMC has prepared a draft Army MRAP Programmatic Environmental Assessment (PEA) for the Mine Resistant Ambush Protected (MRAP) Joint Program Office (JPO), dated December 2010. The PEA was performed at a "programmatic" or System of Systems (SoS)-level. It addresses impacts of the MRAP Program throughout the entire acquisition life cycle as currently understood. Specifically, the draft PEA addresses potential environmental impacts associated with the production, testing, training, deployment/fielding, and demilitarization/disposal of the Army MRAP Family of Vehicles (FoV). The draft PEA provides programmatic analysis of the potential environmental consequences of the proposed action on the following environmental resource areas: biological resources, soil resources, air quality, water quality, land use, cultural resources, hazardous materials and hazardous waste generation, solid waste, and noise during MRAP vehicle production, testing, training, operations, maintenance, and demilitarization/disposal activities.

The conclusions and finding reached in this FONSI are based on a complete and thorough review of the potential impacts and analyses considered and disclosed in the December 2010 draft Army MRAP PEA attached to this FONSI. The PEA has been incorporated into this FONSI by reference.

ALTERNATIVE CONSIDERED:

The Joint Services (U.S. Army, Marine Corps, and Air Force) evaluated current force vehicles such as a modified and improved High Mobility Multi-purpose Wheeled Vehicle (HMMWV) and the Up-Armored HMMWV (UAH). The modified HMMWV and UAH did not meet survivability requirements and were eliminated from future consideration in the MRAP Program. The Joint Light Tactical Vehicle (JLTV) was also considered but is still in the design phase and not yet available for production. As a result of these limitations, the previously listed vehicle systems were eliminated from consideration in the MRAP Program.

The PEA prepared in support of the MRAP program considered two alternatives: (1) the preferred action, acquisition of MRAP Family of Vehicles (FoV); (2) a no action alternative. Only the preferred action meets the requirements well documented in multiple Statements of Need

(SON), Urgent Universal Need Statements (UUNS), and Joint Urgent Operational Need Statements (JUONS) submitted by Operating Forces (OPFORS) and Central Command (CENTCOM). Under the No Action Alternative, the MRAP would not be procured or used in CONUS or OCONUS. The No Action Alternative would consist of the continuation of current ballistic protection capabilities utilizing existing Joint Services equipment and personnel.

PROPOSED ACTION (PREFERRED ALTERNATIVE):

The Proposed Action (preferred alternative) consists of production, testing, training, deployment/fielding, and demilitarization/disposal of the Army MRAP FoV.

The MRAP vehicle program is a Joint Service Program between the United States (U.S.) Army, U.S. Air Force, U.S. Navy, U.S. Special Operations Command (SOCOM) and the U.S. Marine Corps (USMC). The USMC has been designated as the lead agency and thus directs the MRAP JPO. Contracts were initially awarded to nine manufacturers followed by a down selection to the current six manufacturers.

The MRAP Program is divided into three categories to support the expected vehicle missions. The Category (CAT) I MRAP vehicle must be capable of supporting operations conducted in an urban environment, and transporting no less than six personnel. The CAT II MRAP vehicle must support multiple missions, to include convoy operations, troop transport missions, ambulance missions, and explosives for maneuver battalions; while transporting no less than 10 personnel. The CAT III vehicle supports mine and explosives clearance missions with a capability of transporting no less than six personnel.

The current acquisition includes the following variants:

Table 1: 6 MRAP Manufacturers and Variants

Manufacturer	Variant
BAE Systems	CAT I RG33
	CAT II RG33L
	Heavy Armored Ground Ambulance (HAGA)*
BAE-Tactical Vehicle Systems (TVS)	CAT I Caiman
	CAT II Caiman
Force Protection Industries, Inc. (FPI)	CAT I Cougar
	CAT II Cougar 6x6
	CAT III Buffalo
General Dynamics Land Systems – Canada (GDLS-C)	CAT I RG31 Mk 5E
Navistar Defense	CAT I Maxx Pro
Oshkosh Truck Corporation	M-ATV

A full description of the Proposed Action is provided in the draft Army MRAP PEA.

ENVIRONMENTAL CONSEQUENCES:

The draft PEA evaluates environmental impacts by environmental resources area (ERA) on a programmatic level. It looks at those potential impacts applicable at all (or nearly all) locations where MRAP activities occur. Testing, training, and fielding sites may have site specific conditions and resources which are unique to that site and thus, may require further NEPA analyses. Personnel at these Government sites are responsible for site specific NEPA documentation that addresses the actions at their installations.

Soil Resources

The majority of production occured in existing buildings, and when new construction did occur, it occurred on non-pristine land. The draining of vehicles occurs over a hardened surface into appropriate containers. Manufacturer personnel utilize drip pans to contain leaking fluids and use spill kits during fluid spills. Potential MRAP impacts on soil resources during testing, training, and fielding activities are attributable to the maneuver of MRAP vehicles on and off road. These effects can be mitigated through strict adherence to local installation regulations. No direct, indirect, or cumulative impacts to soil resources are anticipated or have yet been reported for Army MRAP life-cycle activities.

Land Use

The manufacturers conduct the majority of MRAP vehicle production in pre-existing buildings, and when new construction did occur, it occurred in areas that already contain industrial buildings and utilities. MRAP vehicle testing and training utilizes existing test courses and ranges. MRAP training and deprocessing activities utilize existing structures and outdoor storage areas. No direct, indirect, or cumulative environmental impacts on land use are anticipated or have yet been reported during the life-cycle use of Army MRAP vehicles.

Air Quality

MRAP variants are considered combat vehicles thus, Title 40 CFR 85.1703 and 89.908 exempts the MRAP variant engine from both on-highway and non-road diesel engine emission standards requirements. However, the MRAP engines are certified to various Federal and European engine emissions standards varying from EPA 1998 on-highway standard to EURO III emission standards. No Class I or Class II Ozone Depleting Chemicals (ODC's) are used in the MRAP Vehicles' air conditioning systems or fire suppression systems.

Painting/coating applications will be done in permitted paint booths except for touch-up painting. The paint booths contain the necessary pollution abatement equipment to minimize air emissions as well as contain fugitive emissions. Other materials containing Volatile Organic Compounds (VOC's) and Hazardous Air Pollutants (HAP's) may be used on the MRAP vehicles

during production and maintenance activities including solvents, metal parts cleaners, anti-seize compounds, lubricants, and adhesives. The use of these compounds would be in limited quantities per application. The application of the compounds also occurs for a short duration with a minimum amount of the compounds' total volume becoming airborne.

Air emissions associated with the MRAP integration and manufacturing did not cause the manufacturers' facilities to exceed air emission permits, and production of the MRAP vehicles had a minimal impact on the facilities' surrounding air quality. Only several MRAP vehicles undergo testing/training at one time, which also limits the amount of HAPs and VOCs emissions during repair and maintenance activities. Operation of the MRAP vehicles occurs on a periodic basis and for a limited duration. Additionally, the operators of the vehicles comply with installation requirements to minimize the generation of airborne particulate matter. Thus, the impact to the test/training installations' air quality due to MRAP maintenance or dust generation would also be minimal. There are no anticipated or reported direct, indirect, or cumulative environmental impacts to air quality associated with the life-cycle of the Army MRAP vehicles.

Water Quality

MRAP production activities generated little or no increase in wastewater. Wastewater treatment is dictated by the facility where the MRAP production occurs. MRAP production activities occur inside enclosed buildings. These buildings have floor drains and sewer systems that connect to the facility sewer system. Responses to any vehicle fluid or fuel spill occur in accordance with the facilities' spill response plans. By following facility instructions, plans, and requirements as well as utilizing the appropriate equipment, the migration of vehicle fluids to local bodies of water would be minimized if not eliminated. With the containment and the proper treatment of wastewater, the MRAP production activities have a negligible impact on water quality at the production locations.

Maintenance activities during testing and training sometimes require the removal of hydraulic fluid, engine coolant, and Petroleum, Oils and Lubricants (POLs). The installations have spill prevention control and countermeasures plans (SPCCP) in place which provide guidance on the elimination or control of vehicle fluid and fuel spills. By following the technical manual procedures, other installation requirements, and utilizing the appropriate equipment, the migration of vehicle fluids to local bodies of water would be minimized if not eliminated.

Noise

Within the manufacturers' facilities, some production activities such as drilling and grinding generate noise levels that exceed 85 A-weighted Decibels (dBA). Personnel in these areas have a requirement to wear hearing protection. Exterior facility noise levels associated with vehicle manufacturing/integration remains below 85 dBA. As a result, the MRAP vehicle production has a negligible impact upon the facilities surrounding area.

The testing, training, and fielding activities occur in already developed areas and away from residential neighborhood. There are no anticipated direct, indirect, or cumulative noise impacts that may occur or have been reported for life-cycle activities of the Army MRAP Vehicles.

Solid Waste

With the manufacturers' participation in active recycling programs, and the limited amount of non-hazardous waste that is land-filled in accordance with all laws and regulations, MRAP production activities generation of non-hazardous wastes have a minimal impact on the environment. With minimal waste generation, active recycling programs, and the limited amount of non-hazardous waste that is land-filled, MRAP testing, training, and fielding activities have a minimal impact on the environment as a result of solid waste.

Hazardous Materials and Hazardous Waste

The hazardous wastes associated with MRAP production and maintenance included spent cleaning solvents, metal treatments, machinery oil, excess adhesives and sealants, and waste paint-related wastes. The characterization, handling, and storage of the hazardous wastes generated during MRAP production complies with manufacturer procedures. The manufacturers' facilities have responsibility for hazardous waste disposal. Due to the limited amount of hazardous materials used in vehicle integration and assembly, limited amounts of hazardous wastes would be generated. As a result, any impact to the environment due to hazardous material usage and waste generation is minimal.

The majority of testing, training, and fielding activities such as equipment integration, component removal and replacement do not require the use of hazardous materials. Hazardous materials usage primarily occurs when vehicle fluids are removed or placed into the MRAP vehicles. Some maintenance procedures, however, also require the use of solvents and adhesives, which contain hazardous materials. These activities will be periodically taught during training activities. The volume and type of hazardous waste generated is minimal, and when possible the waste vehicle fluids and solvents are recycled. As a result, the use of hazardous materials and generation of hazardous wastes due to Army MRAP life-cycle activities is minimal.

Socioeconomics

No significant socioeconomic impact is anticipated, as the proposed action should not introduce significant new activity (or levels of activity) in the affected areas. There are no Executive Order (E.O.) 12898 "Environmental Justice" concerns at the MRAP programmatic analysis level since it is not anticipated that the proposed action would result in any disproportional high and adverse human health and environmental effects on children, minority and/or low income populations Health and Safety

Cultural Resources, Biological Resources, Aesthetic and Visual Resources

The majority of MRAP vehicle production occurred in existing production facilities. Any new building construction occurred on previously disturbed land. Training and fielding activities occur in existing buildings and staging areas. No new buildings were built to support these activities. In addition, the installation personnel complied with the installations' Natural Resources Management Plan, Integrated Training Area Management Programs, and other resource management programs. It is not anticipated that the testing, training, and fielding of Army MRAP vehicles will have a significant impact on cultural, biological, or aesthetic and visual resources due to programs already in place at the installations and the fact that these activities will be periodic and of short duration.

Demilitarization and Disposal

MRAP vehicle demilitarization and disposal will follow Department of Defense and Department of the Army guidelines. With the proper disposal of waste streams from the demilitarization activities, it can be concluded that those activities will have a minimal impact on the environment.

CONCLUSION:

The potential effects of the proposed action on the environmental resources at manufacturing sites, test ranges, training facilities, and fielding locations were evaluated in the draft PEA prepared for the Army MRAP FoV. There is no potential for significant degradation of environmental quality. No significant direct, indirect, or cumulative impacts would result, or have yet resulted, form the implementation of the proposed action. There is no potential for a significant impact on protected natural or historic resources. Accordingly, the Joint Program Manager for the MRAP Program has concluded no significant impact on environmental resources will result from the proposed action; therefore, an Environmental Impact Statement (EIS) is not required.

Personnel at the military installations will prepare future NEPA documentation to address installation specific impacts associated with Army MRAP vehicle activities.

Dates

Comments must be received no later than 30 days from publication date of the Notices of Availability publications. The Notice of Availability was published in the weekend edition of USA Today on 28 January 2011. No public comments were submitted.

Point of Contact

To obtain additional information regarding this decision or to obtain a copy of the PEA contact the Tank Automotive Research, Development and Engineering Center Materials and Environmental Team at DAMI_METeam@us.army.mil, telephone 586-282-5733.